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NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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The Glasgow Conference

No one ever had any doubt about the success of the Annual Meeting of the Society of Chemical Industry in Glasgow, but the attendance, the general interest excited by the discussions and excursions, and the smoothness of the arrangements have exceeded expectations. This is the fourth occasion on which the Society has met in Glasgow, and this year's conference promises to rank as the best of the series. Business and entertainment have been very happily combined in a well-prepared programme, and the delegates so far have had nothing but compliments to offer the committee of the Glasgow section.

It is too early yet to attempt a general estimate of the meetings of 1922, but already some features have taken a permanent place in one's recollections. The first is the presidential address of Dr. Ruttan, an unusually comprehensive survey of the problem of scientific and industrial research. In the United States and Canada research is being organised on a generous scale under official direction. Here the prejudice against bureaucratic control is still strong, and it remains to be seen whether, with our national genius for compromise, we shall be able to reconcile the retention of individual initiative with Government control and subsidy. At present the danger of excessive subsidy by the State is a little remote; the difficulty rather is to convince the Government of the need of larger grants in aid of science and especially of chemical science.

One of the best features of the visit to Canada last year was the personal inspection of famous works, and the Glasgow meeting promises to be extremely useful in this respect also, especially in combination with the two sessions of the Chemical Engineering Group. Outside these official gatherings an opportunity will probably be taken to discuss the possibilities of some definite policy and programme to which all the organised chemical interests will be able to subscribe. The tendency has been in this direction for some time, and the Glasgow meetings may play a part in giving it a more definite shape.

Phosphoric Acid for Fertiliser Production

IN America recently the question has been raised of producing phosphoric acid by electrical means and utilising it for the manufacture of fertilisers, mainly as a substitute for the sulphuric acid used for fixing ammonia recovered as sulphate of ammonia. It is claimed that phosphoric acid can be produced by electric furnaces, providing cheap power is available, at a price which will enable it to compete with those fertilisers which are made by the older methods. According to Mr. Theodore Swann, president of the Federal Phosphate Co., phosphate rock is treated in the electric furnace, the process having been developed with the primary idea of producing high-grade phosphoric acid in that the method lends itself readily to the elimination of many of the impurities. Briefly, the process consists in charging the phosphate rock into the furnace together with coke breeze, the breeze supplying the carbon necessary as a reducing agent. In addition, silica rock is added so as to flux out the excess lime present in the phosphate rock, while iron turnings are employed to form ferro-phosphorus, an alloy utilised in the steel industry. It is pointed out that the production of ferro-phosphorus serves largely to remove iron from the acid, which would be difficult to remove if the rock were treated with sulphuric acid as in the old process. The phosphorus evolved in the furnace, when coming into contact with the air above the charge in an enclosed furnace, yields phosphorus pentoxide which is carried over by the gases. When cooled, a portion of this condenses and the remainder is brought down as a liquid by electrical precipitators. The acid as collected contains about 65 per cent. of phosphorus pentoxide.

Apparently, in 1918, the Federal Phosphorus Co. took over the 20,000 kilowatts capacity plant which was erected for the production of ferro-manganese and other alloys during the war. With the end of the war the plant was no longer required, and during the summer of last year it had been put on a commercial basis for its new purpose. As pointed out above, it is proposed to use the phosphoric acid produced for fixing by-product ammonia, thus avoiding the necessity for sulphuric acid, and meanwhile employing one plant food as a "wrapper" for the second plant food. The advantage claimed for a concentrated mixed fertiliser made in this manner and with the subsequent addition of potash is that a ton of it will contain as much plant food as from three to four tons of the ordinary mixed material now commonly employed. Three electric furnaces with an aggregate capacity of 12,000 h.p. are now being operated by the Federal Phosphorus Co. for the production on a commercial basis of ferro-phosphorus and high-quality phosphoric acid for food purposes. So far the special form of fertiliser appears to have been produced only in small quantities, for necessarily the process must be developed slowly and the power consumption must be definitely determined.

Concentrated Fertilisers

SINCE the above was written we have received the current issue of our American contemporary, *The Journal of Industrial and Engineering Chemistry*, in which appears an article dealing with the composition of commercial phosphoric acid. The article relates to a paper which was presented at the last annual meeting of the Association of Agricultural Chemists, and in which some valuable particulars were given in connection with the composition of samples of phosphoric acid prepared from bones, from phosphate rock by the sulphuric acid method, and from phosphate rock by the newer volatilisation method. Mention is made of the fact that mono-calcium phosphate and other soluble phosphates may be produced from phosphoric acid independently of sulphuric acid, and small quantities of these salts are now being prepared in this way. The opinion is given that if this practice was to become general the production of phosphoric acid would then approach that of sulphuric acid; but it is "improbable that the latter acid will ever be replaced by phosphoric acid in the manufacture of phosphatic fertilisers." However, the possibilities in this direction, and the many other uses for which it is employed, emphasise the future importance of commercial phosphoric acid.

So far as the production of phosphoric acid by volatilising the acid from phosphate rock in the electric furnace is concerned, it is shown that this acid is relatively low in such non-volatile constituents as calcium, iron, aluminium, and manganese. In an investigation which was conducted in 1917 by the Bureau of Soils on the volatilisation and recovery of phosphoric acid it was predicted that raw acid prepared by smelting phosphate rock in an electric furnace and collecting the fumes in a Cottrell precipitator would in all probability be of superior quality to that prepared from phosphate rock by the sulphuric acid method, and the results given in the paper now quoted indicate on the whole that the acid produced by the newer method, after collection in the Cottrell precipitator and after treatment, if necessary, for the removal of certain volatile impurities, is at least of an equal grade of purity with any commercial acid on the market. As regards the production of concentrated fertilisers it is pointed out that in the manufacture of superphosphate by the sulphuric acid process the rock is ordinarily treated with only sufficient acid to form the mono-calcium phosphate. No attempt is made to separate the calcium sulphate that is formed in the reaction, and the marketed product is, therefore, lower in phosphoric acid than the original rock from which it is prepared. Most of the other materials that are now used in fertilisers are also low grade and the practice has, therefore, developed of making only low-grade mixtures for use in the fertiliser trade. The use of high-grade materials under present conditions would add to the cost of manufacture, inasmuch as filler would then have to be added to make a fertiliser of the desired grade. It is recognised, however, that if all the standard fertilising elements could be obtained in concentrated form it would then be advantageous to make at least some high-grade fertilisers to supply the demand of distant markets. A source of the nitrogen for such concentrated mixtures is furnished by the fixation of nitrogen in the form of ammonia. When this is neutralised with phosphoric acid a concentrated product is obtained which contains two of the three essential constituents of a complete fertiliser. By mixing this salt with other concentrated materials, such as ammonium nitrate and potassium phosphate or sulphate, it is possible to prepare a concentrated fertiliser having any desired proportion of the fertilising elements.

Hot-Air System of Acid Concentration

IN view of the interest which has been displayed recently by some of our contributors and correspondents in the later modifications of plant for manufacturing sulphuric acid it will not be out of place to draw attention to a newly developed apparatus of the submerged hot-air type which was described by Mr. G. S. Gilchrist at a meeting last month of the American Institute of Chemical Engineers. The hot-air submergence type of apparatus is designed to concentrate any kind of sulphuric acid, and especially separated sludge acid of any quality. The underlying principle of the process is concentration by blowing hot air, at a temperature of about 650° C., through the acid. The process is continuous except that when handling sludge acid the concentration must be carried out in two stages. The two units in which the first and second stages of concentration are conducted are of similar construction. The acid bath is contained in a rectangular lead pan on a raised concrete foundation, the pan being lined with acid-proof brickwork. About two-thirds of the pan is covered with a brick arch through which project the acid-proof iron pipes that carry the hot air under the surface of the acid, while a tower constructed from acid-proof masonry rises from the rear end of the pan to a height of about 30 feet. This tower is packed with staggered brick and provides sufficient surface for the

transfer of the heat from the escaping gases to the incoming acid. The results over a protracted period of operation have shown the oil consumption (oil is used as fuel) to be approximately 35 gallons per ton of 168 Tw. acid when starting with 65 Tw. acid at air temperature. As a contrast it may be mentioned that with the pan system it has been recorded that 90 to 110 gallons of oil are required to concentrate 1 ton of acid over the same range. Each unit is provided with a tower packed with checkered brick which serves principally as a preheater.

The hot air is produced by the combustion of oil in a specially designed combustion furnace which operates under pressure. A blower provides air sufficient for combustion and an excess necessary for the proper regulation of the temperature. The hot air from the combustion chamber passes through a main header to both units and is distributed through manifolds to a point below the acid level in the concentrator bath. When the air at 650° C. is released under the surface of the acid, it quickly gives up its heat and passes out of the bath at a temperature slightly higher than the temperature of the acid. It gives up most of its remaining heat in passing through the preheating tower.

The National Physical Laboratory

GOOD progress in practically all departments of the National Physical Laboratory at Teddington is reported by the Executive Committee, whose Report for the year 1921 has been published by the Stationery Office at 6s. 6d. The scope of the work undertaken at the Laboratory is being systematically increased, and the completion of the extensions and new buildings planned in 1918 has helped these developments along. Owing to the delay in the addition of a third storey to the Metallurgy Building much important work which the department had been asked to undertake has unavoidably remained in abeyance. This portion of the building is now nearing completion, and it is hoped that the work of preparing metals of a high degree of purity will soon be put in hand.

It is to be regretted that a somewhat serious diminution has taken place during the past year in some branches of the test work undertaken by the Laboratory, but in many cases this is attributable to temporary causes such as have affected industry in general. The number of thermometers submitted for test was reduced to about one half in consequence of the abolition of the compulsory testing for export, and there was a further reduction in the number of optical instruments sent for test. The fall has, however, been in some degree balanced by the rise in other classes, notably volumetric glassware and various apparatus tested in the Metrology Department.

An obvious method of increasing the number of articles to be tested would be for the Laboratory to make its multifarious activities more widely known among British manufacturers. At present a vast amount of extremely valuable work is being efficiently and unostentatiously performed at Teddington with practically no publicity beyond that resulting from the issue of the Annual Report, the annual inspection by the General Board, periodical reports on special investigations, and papers communicated by members of the staff to scientific societies, etc.

In the Optics Division some useful additions have been made to the equipment, and the new spectrometer has been completed. The method of immersion refractometry developed during the war has been fully worked out and a simple differential method has been devised for determining the refractive indices of liquids. A programme of research to be carried out for the Lubrication Research Board has been arranged, and further experiments have been made on the reduction in the coefficient of friction of mineral oils due to the addition of small quantities of rape oil.

The outstanding feature of the year's work in the Metallurgy Department is the completion and publication of the Eleventh Report to the Alloys Research Committee of the Institution of Mechanical Engineers. This describes the results of the researches relating to aluminium light alloys carried out in the Laboratory since 1912. Much attention has been devoted to the study of the constitution of various alloy systems, and this has led to a thorough understanding of the mechanism of age hardening after quenching in certain aluminium alloys, especially those containing magnesium. A considerable amount of investigatory test work has been carried out in relation to cases of failure in iron and steel, particularly the cracking of boiler plates around rivet holes.

Points from our News Pages

Dr. E. F. Armstrong, F.R.S., forms the subject of our seventh article on Leaders of Chemical Industry (p. 4).

Specially drawn portraits are published, of Dr. E. F. Armstrong the new President of the Society of Chemical Industry and Dr. R. F. Ruttan, the retiring President (pp. 5 and 9.)

Special correspondents of THE CHEMICAL AGE contribute notes and reports of the Glasgow Annual Meeting of the Society of Chemical Industry (p. 7).

In his address at the annual meeting of the Colour Users' Association, Mr. H. Sutcliffe Smith urged users to co-operate with British dye manufacturers in building up a great industry (p. 13).

The terms are given of the Referee's award removing boric acid from the lists of articles chargeable with duty under the Safeguarding of Industries Act (p. 15).

Sir William Alexander, at a meeting of the Commercial Committee of the House of Commons, replied to statements made by Dr. Levinstein before the same body (p 16).

According to our London Market Report quite a satisfactory amount of business has been placed during the week. Prices are steady with strong competition (p. 25.)

Our Scottish Market Report states that small inquiries have been numerous during the past week, with prices fairly steady (p. 27.)

The Calendar

July 8	British Association of Chemists. Special General Meeting. 3 p.m.	Midland Hotel, Manchester.
11	Aldwych Club Luncheon. "Europe as a Market." Sir Ernest J. P. Benn. 1 p.m.	18, Exeter Street, W.C.2.
19	Rotary Club Luncheon. "The Trade Conquest of Europe." Sir Ernest J. P. Benn. 1 p.m.	Hotel Cecil, London.
26	Research Association of British Rubber and Tyre Manufacturers. Opening of Research Laboratories by The Right Hon. Lord Colwyn. 3 p.m.	105 - 7, Lansdowne Road, Croydon, Surrey.
13	Association of British Chemical Manufacturers. Annual Meeting. 2 p.m.	Burlington House, Piccadilly.

Leaders of Chemical Industry

VII.—Dr. E. F. Armstrong, F.R.S.

THE case of Dr. Edward Frankland Armstrong, the new President of the Society of Chemical Industry, is one of many to be found in the chemical profession, in which high reputations made by fathers and grandfathers have been worthily maintained in the same family for a long period of years.

Born in 1878, the son of Professor H. E. Armstrong, F.R.S., and grandson of Richard Armstrong, a prominent Mark Lane merchant, he early decided on an industrial in preference to an academical career, and between them father and son would represent a very complete combination of pure and applied chemistry. One might, indeed, go farther, and say that Dr. Armstrong combines in himself the theoretical study with the practical applications of chemistry in a quite uncommon degree, and he thus enters the chair of the Society of Chemical Industry exceptionally well equipped by training and experience.

As the really big men often do, Dr. Armstrong carries his learning lightly. As a type he is as far removed as one could imagine from the wizened recluse of the laboratory depicted in fine antique book-plates. Much more readily might he be mistaken for a bluff and hearty country squire, and if one met him with dog and gun following the partridges through the turnips the impression would be deepened. But in spite of his out-of-doors appearance, Dr. Armstrong has really been a hard student, as we shall presently see. The almost boyish freshness of spirits which has survived severe study and heavy commercial responsibilities is largely the result of simple methods, a clear mind, and an even temperament. One may hazard a guess that his mind wastes none of its energy on irrelevancies, but selects without conscious effort the things that really matter. It is not so much a studious cultivation of the sense of order as a natural incapacity for disorder; an eye that picks out the things requiring to be seen, and overlooks the rest. This is the kind of mind which shifts work in quantities without fuss and without much apparent effort, and which makes difficult and big things look so illusively easy to others. Nor are his qualities all on the surface. His quiet manner might easily conceal from the undiscerning the stores of experience which lie in reserve. When the occasion comes, however, he can bring these reserves to bear with immediate effect on a discussion or a business problem, and it is safe to say that those who know him best value his judgment most. One of the best services he could render as President of the Society of Chemical Industry would be freely to let us know what he really thinks about things.

Academical and Commercial Career

But we must leave these generalities and come down to facts. Dr. Armstrong holds the degrees of D.Sc. (London); Ph.D. (Berlin); and Associate and Fellow of the City and Guilds Institute. He is a Fellow of the Institute of Chemistry and of the Royal Society. He studied at the Royal College of Science and the Central Technical College, London; the Universities of Kiel (under Professor Claisen) and Berlin (under Professors van't Hoff and Emil Fischer). He also worked at Copenhagen with Professor E. G. Hansen. On his return to England he was awarded the Salters' Company's Research Fellowship of the City and Guilds Institute, and deciding upon a technical career went to Huntley and Palmer, Reading, as chief chemist. After nine years there, he joined Joseph Crosfield and Sons, Ltd., at Warrington, and for the past seven years has been Managing Director of that firm, and also, until the end of 1920, of William Gossage and Sons, Ltd., Widnes and Liverpool, and of a number of associated companies of these two firms throughout the world.

Dr. Armstrong's original studies cover a wide field. He carried out research on the formation of acetals with Professor Claisen at Kiel; on the hydrates of calcium sulphate with Professor van't Hoff, for which work he was awarded his Ph.D.; and on uric acid, carbohydrates and enzymes with Professor Fischer, publishing a considerable number of papers in the German journals. While at Copenhagen he worked on the Selective Action of Yeasts, and published the results of this research in the Royal Society Proceedings. On returning to England, he took up the systematic study of enzyme action, and his work during the three years of his Fellowship enabled him to formulate an explanation of this subject which has since been generally accepted.

His scientific work did not terminate with his entrance into industry; he continued in his spare time the enzyme investigations, and published a number of papers in the Royal Society proceedings. He took special interest in problems of plant chemistry, particularly the inheritance of chemical factors, and co-operated with Professor, now Sir Frederick, Keeble in this work. As this was an entirely new field a very large amount of investigation was required before publication became possible. They had reached a stage when very fruitful results were coming in, when the transference of Dr. Armstrong to the North and of Professor Keeble to Wisley and the outbreak of the War caused the cessation of this work, with the consequence that a great deal has remained unpublished, the more so as the work was done for the love of it rather than for the sake of publication and advertisement. Of recent years he has, in collaboration with Dr. T. P. Hilditch, undertaken the well known series of investigations on catalysis at solid surfaces.

Apart from his manifold technical duties, Dr. Armstrong takes a great interest in labour matters, and is chairman of the Soap Employers' Federation, and also of the Joint Industrial Council for the soap trade set up under the Whitley scheme. He is a member of the Warrington Labour Advisory Council, and many similar bodies, and a J.P. for the County Palatine of Chester. His work has involved the study of questions of works management and the handling of labour from a scientific point of view. A large amount of data on such subjects as industrial fatigue, etc., has been accumulated, and this has enabled Dr. Armstrong to give evidence before half-a-dozen Government committees on the subject during the last few years.

In the application of science to industry and in the cause of co-operation among scientific workers he has taken a very keen interest. He has served on the Council of the Chemical Society, the Institute of Chemistry, and the British Association. He took a very active part in the formation of the Association of British Chemical Manufacturers, which he regards as the representative body of British Chemical Industry, and has served both on the Council of this body and on most of its committees which have sought to establish co-operation with scientific workers. In his private life, Dr. Armstrong has broad interests: he is an enthusiastic and successful gardener and takes a great interest in etchings.

During his year of office we hope to publish Dr. Armstrong's views on many aspects of chemical industry—with equal advantage to the Society and to the public.

[*Continued on page 6.*]

The New President of the Society of Chemical Industry

Dr. E. F. Armstrong, F.R.S.

For the present some opinions expressed in the course of a brief interview must suffice.

Chemistry and the Nation

"I feel," said Dr. Armstrong, "that the nation ought to know a great deal more about the debt it owes to chemistry, and the extent to which its industries are dependent on applied chemistry, than it does at present. For that condition, I fear, the nation is less to blame than chemists themselves, who are too often inclined to confine themselves to a little world of their own. Chemists must not simply grumble about the nation not appreciating them and their work; they must set to work to make the nation appreciate them by explaining their work in terms that the public can understand. There is, of course, a public side to chemistry as well as a purely scientific side, for it is the science which more than any other permeates all our industries in a greater or less degree, and which, in addition, vitally affects certain aspects of national welfare and even national safety. No other science occupies quite the same position. It is, therefore, of real importance that there should be an intimate understanding between national and chemical interests—that the nation should know a great deal more than it does at present of what chemistry is doing for its welfare, and on the other hand, that chemistry should have a larger share in deciding the many questions affecting our national and industrial welfare with which it is so intimately mixed up.

"I am entirely in agreement with Sir William Pope's scheme for the establishment of an Advisory Science Committee, on which chemistry should be strongly represented. In the United States, chemical organisation is a long way ahead of our own. There, they can speak with a united voice on behalf of thousands of chemists, and well-known men in the profession and industry take a leading part in public life. The result is that when the Government intend to deal with matters affecting chemistry, they find it to their advantage to consult the organised chemists of the country. The latter, on the other hand, when they desire to get something done, or to prevent something they object to from being done, can bring their influence to bear with direct effect in the right quarters. In this country, chemists do not exercise the influence to which they are entitled in such matters, because they have not troubled to organise themselves for that purpose, and I think the time has come when chemists should make a move in the matter. The advantage would be mutual. The nation, and especially the Government, would be much better informed on matters with which from time to time they have to deal, and the interests of chemistry would benefit by securing very much fuller consideration than they get at present.

Status and Training of Chemists

Touching on the status and training of chemists, Dr. Armstrong proceeded: "I think we may congratulate ourselves on the great advances which have been made in recent years in this country. It is no longer necessary, as it formerly was, for a young man to have to go abroad to obtain a sound chemical education. At the same time, I am strongly of opinion that any chemist who wishes to go far in his career should seek as wide an experience as possible, and he ought not to neglect the Middle West of America as well as Europe. This is especially important for those who contemplate an industrial career. It has been pointed out again and again, what a large part in Germany the scientific and technical men take in the management of the great chemical concerns; but if the technical man is to take this position, he must be something more than a merely technical man. He must combine science, technology, and business, because all three must be co-ordinated in the closest way to secure commercial success. There seems to be something wrong with many of our chemists in this respect, and the remedy seems to lie in broadening out the qualifications of the chemist. It is necessary that he should be, in addition to being a trained scientist and technologist, a man of broad outlook and wide experience if he is to become a real leader in industry—in short, he must be a man of the world and a man of business as well as a sound scientist.

"In Germany it has been different for a very simple reason. After 1870, Germany set out to educate their people. Most of the money got from France was spent in this direction; it was said that two-thirds went into the schools and one-third into the barracks. That money bore interest at a wonderful rate; it was the ambition of everybody to become educated. The result was an enormous mass of what you might call high-class skilled brain labour which yet could be bought cheaply, because those who had scraped together £5 a month to get to a University were prepared to accept wages and salaries from chemical firms at a relatively low figure. Then the German chemical industry, founded by the advanced scouts of the intelligence brigade, men of high scientific education, realised that in order that their chemists should produce their best work they should be in conditions suitable for that work. The seed was planted in a soil which allowed it to develop. In that way the German industry began to build itself up. Over here, the inventor, often of quasi-scientific training, usually approached some financier who probably recognised in him a business 'mug,' and, if possible, made some profit for himself while the process went on the rocks. The Germans avoided these mistakes. The German chemist who made an invention in the laboratory was recognised as helping to build up his firm and got rapid promotion. As a result, the organic chemical industry of Germany had opportunities of development which it did not enjoy here.

German Commercial Foresight

"In addition to this, the leaders of German chemical industry showed great foresight in taking advantage of natural assets like the Rhine, and they developed great combines for making the most of the markets. In the alkali industry, however, brains met brains. The people who got in first were British. Mond and Brunner, impressed with the value of the Solvay Patents, put real work into the business, and with dauntless courage established the alkali industry in this country. Not only that, but maintaining an honourable friendship with the Solvays, they built up a great international combine, and demonstrated that it was quite possible for us to stand up to German competition.

"But contrast the use which the Germans have made of the Rhine, with the neglect by our great manufacturing concerns of such an asset as the Manchester Ship Canal, and the active opposition which that great enterprise encountered. There is something lacking in our sense of co-operation. We are great as individuals, but collectively we are not good at thinking ahead and realising the potential value of our sites and industrial centres, and what can be made out of them. In America and Germany, one is at once struck by the way in which railways, waterways, and all classes of public utilities are organised to facilitate industry, while British trade suffers from the stranglehold of transport charges and sheer inefficiency in organisation.

"We are, I hope," concluded Dr. Armstrong, "learning something from our past mistakes and neglect, but we have much lost ground to make up in several directions. It can only be done by making our science, technology, and business organisation of the very best, and then bringing them into a collective and harmonious relation to achieve definite commercial aims."

The Society of Chemical Industry

Notes and Reports of the Glasgow Meeting

We give below reports of the proceedings of the Annual Meeting of the Society of Chemical Industry, which opened in Glasgow on Tuesday. The remainder of the proceedings will be dealt with in our issue of next week.

Notes on the Conference

[By Our Own Correspondent.]

Glasgow, Tuesday Evening.

The first impression of the Glasgow meeting is one which it is a pleasure to record. So far as the opening day's proceedings go, this year's meeting promises to be in every way one of the most successful of recent years. The attendance is so large that at the annual general meeting held this morning the fine hall of the Institution of Shipbuilders and Engineers was completely filled with members and guests, and the luncheon which followed at the Grosvenor Restaurant was one of the best attended in the history of the Society, and one which was made additionally happy by the spirit of good-fellowship which abounded. In addition to its size, this year's annual meeting is also widely representative. While Scotland is more than usually well represented, there is a good attendance from London and the chief provincial centres, and a pleasant sprinkling of Colonial and other overseas visitors.

The first thing that has impressed all is the excellence of the arrangements made by the Glasgow committee, with Mr. Young acting as chairman and Dr. Cranston as secretary. The first day's proceedings have gone through without a hitch because of the hard work which the local committee has given to the task of securing success in advance. The first objects which confronted the delegates when they approached the Conference Hall were The Chemical Age posters beside the entrance. The supply of copies containing the programme of the proceedings was soon exhausted, and there was much discussion on the excellence of Dr. Miall's portrait and the scheme he explains for the establishment of a central body to promote a definite chemical programme. Inside, in the local offices, the delegates found a staff of most obliging officials and a singularly complete supply of literature bearing on the arrangement. The official handbook, edited for the local executive committee by Dr. Cranston, might, in its attractiveness and in the completeness with which it supplies just the information the delegates require both for business and for pleasure, very well stand as a model for such publications. The book will remain as more than a memento of what promises to be a completely successful meeting; it is given a permanent interest by an admirable article on "The Chemical Industries of the West of Scotland," by Mr. W. H. Coleman, F.I.C.

The annual general meeting began at 10.45 this morning and was over in less than two hours. It was opened with an official welcome from the Lord Provost. His address in its substance and expression could hardly have been improved upon; it described the suitability of Glasgow as a centre for a meeting of the Society and it emphasised the vitality of the connection between chemical research and the improvement of industrial processes with an intimacy and accuracy that no leader of chemical industry could have excelled. It was, in fact, a perfect little presidential address in itself.

Dr. Ruttan followed with his address for the year as president, which was prefaced by a very cordial acknowledgment of the reception by the Lord Provost and of the excellence of the arrangements made by the local committee. The address, which occupied about an hour and a quarter, covered very comprehensively the whole field of scientific research, both in theory and practice. Naturally it was largely concerned with the organisations in Canada and the United States, with which Dr. Ruttan is so familiar. It conveyed a volume of information too large to be absorbed at one sitting, and it is satisfactory to know it will be published in full in due course. Incidentally one gathered that Dr. Ruttan has little sympathy with any idea of permanently excluding Germany from participation in the councils of chemical science. His attitude was summed up in such phrases as "the universalism of science and the catholicity of truth," and "the closed door shuts out more than it shuts in."

The address covered such a wide field that it is difficult to indicate simply what it culminated in. Its main purpose seemed to be to explain the theory and practice of a very thorough system of research endowed and, of course, directed by the State. I find this aspect of the address being very actively discussed among the delegates, who after our war experiences are not too eager to transfer private initiative into the custody of permanent departmental officials.

Dr. E. F. Armstrong, the new president, who proposed a vote of thanks to Dr. Ruttan, was the first to give public expression to a doubt on the subject. Speaking of the prospect of establishing a bureaucratic control of research in the future, he dryly remarked, "If bureaucratic control is the best way to do it, all will be well—but I wonder!" And there he left it. But whatever view may be taken of the general theme, there is no question as to the great body of information on the subject which Dr. Ruttan's address contributes, and the vote passed to him was deservedly cordial.

The business of the annual meeting did not last long, there being but little to do beyond approving the decisions of the council, which had met earlier in the morning. The membership showed a decline from 5,654 to 5,270, but against this Mr. Evans, the treasurer, was able to report a credit balance on the year's operations of £3,600. For various reasons, however, this looks better than it actually is, and Mr. Evans gently evaded the congratulations showered upon him as Chancellor of the Exchequer in order to warn the Society against the peril of excessive optimism. None the less the facts as reported to the meeting were received as very satisfactory.

Immediately after the meeting the members moved off to the Grosvenor Restaurant, where a very large party, which completely filled the room, was entertained to luncheon by the Glasgow Section. Mr. J. H. Young, the chairman of the Section, presided, and amongst those supporting him were Dr. Ruttan, Mrs. Paxton (wife of the Lord Provost), Sir William Pope, Dr. E. F. Armstrong and Mrs. Armstrong, Sir John Samuel, Professor G. G. Henderson, Mr. D. Perry and Mr. E. V. Evans. The Chairman, in simple and sincere terms welcomed the members to Glasgow, and remarked that if the week's meetings only succeeded in advancing to a small degree the work of the Society the members of the Glasgow Section would feel well rewarded. Dr. Cranston added a few words about the arrangements for the week, and Dr. Ruttan briefly returned thanks for the Society.

The afternoon was pleasantly occupied with a garden party at the Knowe, Pollokshields, by invitation of Mr. David Perry, and in the evening there was a reception and dance in the Municipal Buildings by invitation of the Lord Provost and magistrates of the city. To-morrow morning a large audience is expected for Professor H. E. Armstrong's

first Messel Memorial Lecture, the title of which is "Rhapsodies culled from the Thionic Epos."

Everywhere I find complete sympathy with Sir William Pope's suggestion for the establishment of a Chemical Advisory Committee, and probably some definite steps may be taken before the Annual Meeting closes to give the movement a start.

Wednesday.

The Messel Memorial Lecture this morning was a brilliant success. It would be as impossible to summarise its matter as to define the lecturer. It was Professor Armstrong at his best and in his most characteristic mood. The lecture may best, perhaps, be likened to a Byzantine mosaic, rather dazzling in its changing effects and sudden flashes of colour. Its brilliance left even the most academical a little bewildered and anxious for an opportunity of thinking it over before venturing upon an opinion. Its publication will certainly be looked forward to with keen interest, and everyone hopes to see it in its unrevised form, exactly as Professor Armstrong delivered it. It is difficult to imagine any official lecture more full of subtle humour and irony or more candid in its criticisms and generalisations. It showed us all sorts of things, familiar and unfamiliar, in all sorts of oblique and striking lights. It was not only a memorial to Dr. Messel—it may stand very well as a memorial of the lecturer himself—as one of the most masterly and fascinating pieces of self-expression the Society has ever been favoured with.

The presentation of the Messel Medal to the lecturer was performed by the president (Dr. Ruttan), and a few remarks perfectly befitting the occasion were added by Sir William Pope. At the close of the lecture, the vote of thanks to Professor Armstrong was passed with real enthusiasm on the motion of Professor G. G. Henderson.

I am informed to-day that the pressmen of Glasgow are taking up officially a rather unfortunate incident which occurred on Tuesday. At the conclusion of Dr. Ruttan's address, application was made to see his manuscript for the purpose of preparing reports, and the application was refused—not, of course, by the President, but by others—although some concession was made later. This, however, came too late to be of any use to some of the pressmen, and the result is that the President's address missed a great deal of the general publicity in the daily Press of the whole country which it would otherwise have obtained. I understand that the matter is to be considered by the Glasgow branch of the National Union of Journalists, a body which is very keen on securing reasonable courtesy for its members from public bodies.

Reports of the Proceedings

THE 41st annual general meeting of the Society of Chemical Industry was opened on Tuesday in the Institution of Shipbuilders and Engineers, Glasgow, under the Presidency of Professor R. F. Ruttan, of Montreal.

Welcome by the Lord Provost

Before the usual business commenced, the Lord Provost of Glasgow (Mr. Thomas Paxton) said it gave him very great pleasure to attend the opening meeting of the Society and to extend to the delegates a very cordial welcome to Glasgow. He wished to congratulate the Society on the great progress it had made since it last met in Glasgow in 1910, both in the increase in its membership and the contributions it had made to our knowledge in the scientific and practical applications of chemistry. He was delighted that Glasgow had again been chosen as the place of meeting because it was recognised that the district owed much to its chemical industries, and in the interval that had elapsed since the Society last came to Glasgow, the City had not stood still in its efforts to show its appreciation of the furtherance of science in all its aspects. The Corporation of Glasgow was largely interested in a corporate capacity, in chemical industry. They had established a highly specialised chemical section to the Health, the Gas and the Sewage Departments under the control of an eminently distinguished scientist; he believed Glasgow had some of the best organised gas works in the country, and there was a special chemical department attached to them, whilst there was also a special chemical department attached to the Sewage Department. Further, if he might be permitted to allude to the manner in which the University of Glasgow had appreciated the place of chemical science in its organisation, he would simply refer to the fact that during the past few months, the chemistry department had been very considerably strengthened by the addition of new Chairs, and as showing the interest the University took in the work of the Society, he referred to the fact that Sir Donald Macalister, the Principal of the Glasgow University, was present that morning.

In no other branch of science did the great industrial centres look for more beneficial results than in chemistry. The patient investigation and inquiry which had always distinguished our chemists had resulted in some of the most marvellous discoveries of modern times, discoveries which had not only added to our knowledge in an abstract sense but had widened and developed the field of our industries in directions which had had a momentous effect on mankind. The realm of scientific inquiry in multiple directions had not yet been exhausted and there was scarcely any department of human activity that could afford to ignore the services of the chemist. Year by year his importance as a factor in the preservation of the health of the community was being increasingly recognised and appreciated. He expressed the hope that the result of the meeting in Glasgow would be to increase interest in the objects of the Society and to add still further to the discoveries to which he had already referred. If that result was achieved, then they would have reason to congratulate themselves on the honour Glasgow had been done by being chosen as the place of meeting this year. He felt sure that the papers that were to be read and the subjects which were down for discussion would do much to benefit humanity and benefit the great science of which all those present were leading exponents. He would not say more at the moment because he hoped to have the pleasure of addressing them again in the evening. He therefore extended a hearty welcome to the Society on behalf of all the citizens of Glasgow.

The President's Reply

The President expressed the sincere thanks of the Society for the welcome that had been so courteously and heartily offered to the Society. He considered it his good fortune that during his term of office the meeting should have been held in Glasgow, for he knew of no other city in Great Britain more perfectly fitted for a meeting of the Society of Chemical Industry than Glasgow. Not only had it a most interesting and historical environment but it was a city which was known throughout the Empire as a great seat of chemical industry, one of the great centres at any rate, of the coal, the iron and the steel industries. It was a pioneer in the establishment of the bichromate industry, sugar refinery and the distillation of shale and, above all, in the manufacture of chemical plants. It might be of interest to the Lord Provost to know that the first great plant for the distillation of wood which was sent to America, came from Glasgow. The process was known then as the Scotch process, a process which had only been slightly modified since except in the direction of making it very much larger and of greater capacity. The Empire associated the City of Glasgow with the great pioneers of chemistry and the industry of chemistry; the names of Joseph Black, and Tennant, and, later on, of Lord Kelvin and Ramsay were indissolubly connected with the City of Glasgow. The influence of Kelvin and Ramsay had extended to the utmost quarters of the British Empire and beyond that, throughout the whole realm of civilisation and had advanced the development of science. Therefore, the citizens of Glasgow might well be proud of their city which had taken such a very

[*Continued on page* 10.[

Retiring President of the Society of Chemical Industry

Dr. R. F. Ruttan

prominent part in the past, in chemistry, and to-day was playing such a very important part in chemical industry. He therefore again thanked the Lord Provost for his very cordial welcome.

After the Lord Provost had acknowledged the thanks of Dr. Ruttan, the ordinary business of the meeting was then proceeded with.

Messrs. McCallum and McGregor were appointed scrutineers for the ballot. The minutes of the previous annual general meeting were taken as read, as was the annual report of the Council.

Report of the Council

The Council, in their report for the past year, state that the number of members on the register is now 5,270, as compared with 5,654 last year. Since the last annual meeting 260 members have been elected, 22 former members have been restored to membership, and the losses have been 665. The Council regrets to record the deaths of 37 members (of whom 10 were original members). It has approved proposals from the Edinburgh and Nottingham Sections to admit "Associates" to meetings of the Sections at a nominal annual subscription, on the same conditions as were laid down in the case of the Glasgow Section.

A new Section of the Society has been formed for South Wales with headquarters at Cardiff. Meetings will be held alternately at Swansea and Cardiff and it is hoped that a considerable accession of new members to the Society will result. The area covered by the new Section has hitherto formed part of the Bristol and South Wales Section, which in future will be known as the Bristol Section.

Reference was made in the last Report of Council to a tentative proposal which had been submitted to the Council for the formation of another Subject Group. This matter is still under discussion.

The experiment which was made in October of holding a dinner of the Society in London was most successful, and it is proposed to hold a similar function in London each year that the annual meeting takes place in the provinces or in one of the overseas Sections.

With regard to the proposal of the Chemical Society that papers intended for its Transactions might be read at provincial Sections of the Society of Chemical Industry, and that Fellows of the Chemical Society resident in the locality be invited to such meetings, the committees of the Sections have now expressed their cordial approval of the scheme, and a working arrangement has been entered into between the two Societies for the purpose of giving effect to it.

The Council decided not to re-elect the large number of committees which have been in existence for the past three years, but has continued the Publications Committee and the General Purposes Committee.

The establishment of a General Council to look after the interests of the Society as a whole in Canada and to deal with questions which may arise with regard to Federal and Provincial Legislation has been approved by the Council.

The new scheme for the Latham Research Fellowship, proposed by Mr. C. F. Cross, F.R.S., and approved by the Council, is now in operation. The Council has renewed for 1922 its donation towards the expenses incurred in connection with the extension scheme of the Chemical Society's Library.

In response to the application which the Council made to the Government through the Conjoint Board of Scientific Societies for financial assistance in defraying the cost of a Collective Index to the *Journal* for the years 1906 to 1920 the Chancellor of the Exchequer regretted that in view of the paramount importance of reducing public expenditure he is unable to contemplate any increase of existing grants. The Committee of the Conjoint Board considered that in the circumstances it would be useless to press the matter further, and the Council concurred in this view.

The Council of the Association of British Chemical Manufacturers has expressed its willingness to co-operate with the Council of the Society in a scheme of chemical propaganda in connection with the British Empire Exhibition, 1924.

Mr. J. H. YOUNG moved the adoption of the report.

Mr. GRANT HOOPER, who seconded, said he did not think the opportunity to say a few words on the report ought to be allowed to pass. In the first place, he was sure they would all wish to welcome their President from Canada. In the next place, they would congratulate themselves that the report of the Council represented, on the whole, distinct progress; not progress, he was sorry to say, in the matter of members, because they had to lament a slight diminution in the number of members, but he, nevertheless, thought they could congratulate themselves upon the fact that there had been an increase in the number of Sections. In connection with the diminution in the number of members, the Council would always have to bear in mind that first of all—and he was sure they all lamented it—the chemist was a very underpaid man; and secondly, the Society consisted to a very large extent of young members. Whilst there would be a tendency for an increase in expenditure, more especially with the production of the *Journal*, and although they welcomed the fact that thereby the *Journal* was made more interesting, nevertheless, the first business of the Society and the *Journal* was to provide for the younger members of the Society and the world-wide knowledge which was necessary to record progress, the constant progress, of chemical science. Therefore, they must remember that whilst they welcomed anything in the way of enlargement, they must also remember to have regard to the capacity of the younger members to pay. The members owed a great debt of gratitude to the Council of the Society for the work it had done during the past year, and of which the report so eloquently spoke.

Treasurer's Report

Mr. E. V. EVANS, in presenting the financial statement for the year, said that on the last occasion when he had the honour to bring forward the financial statement it might be remembered that, for the first time for a number of years, the income slightly exceeded the expenditure. It might also be remembered that that was due to some special circumstances. This year the balance sheet showed that the Society's financial position had continued to improve and the excess of income over expenditure for the year was £3,747 11s. The stocks of the Society had appreciated; whereas in the last balance sheet, depreciation of stocks was allowed for at the rate of 36·5 per cent., it was now only necessary to allow for depreciation at the rate of 29·8 per cent., and this difference represented the sum of £1,200. That was a very satisfactory state of affairs, but he would ask them not to be too optimistic about it. The income of the Society was not a stabilised one, and an examination of the balance sheet would show the important contribution made last year by the advertisement department. The expenses of the Society, which were mainly the cost of producing the *Journal* and the expenditure incurred on the Sections, amounted approximately to £3 7s. per member, and against that there was such a contribution from the advertisement department that this figure was reduced to £2 16s. per member. It would be seen from this what an important part was played by the advertisements, and he was sorry to have to report that owing to the slump in trade, which seemed to have been even accentuated in the chemical industry, it was not so simple to find advertisements to-day as was the case last year. This was bound to affect adversely the financial position of the Society as they saw it to-day.

Since the last meeting, the Council had been giving consideration to certain ideas and schemes which had been formulated with a view to extending the activities of the Society and of increasing its usefulness to members. It was right that the members should know that although expenditure had been sanctioned in certain directions, none of these schemes had yet been put into operation, owing to the fact that the Council had strictly adhered to its decision to re-establish the financial position of the Society before incurring further responsibility. The initial expenditure involved in the creation of the Messel medal represented the first outlay under this fund and he felt confident that the members of the Society would be in full accord with the steps that had been taken by the Council to commemorate the memory of Dr. Messel.

The Hon. Treasurer's Work

Dr. STEPHEN MIALL, moving the adoption of the accounts, said the satisfactory position that had been reported was in no small measure due to the great care and trouble and immense amount of time which the hon. treasurer had devoted to the well-being of the Society. He had watched over the expenditure in a most exemplary manner and had never been willing

to spend 10s. where 2s. 6d. would suffice. Mr. Evans had thoroughly taken to heart the precepts of the great French philosopher, Courtelene, who said "why should I spend 12s. 6d. on an umbrella when I can get a glass of beer for 3d."

Dr. CARR seconded the motion and supported all that Dr. Miall had said with regard to the work of the hon. treasurer. To look at Mr. Evans, they would hardly think they had got a man who could look really severe when any question of expense came up, but he could assure them that they had. Two years ago, the duty of taking on the treasurership of the Society was by no means a pleasant or rosy task. Mr. Evans, however, accepted that task and had carried it out in a perfectly successful manner.

The financial statement was then adopted.

The Presidential Address

THE PRESIDENT said that by selecting a Canadian chemist for their president, they had conferred on Canada the highest honour they could confer, and on behalf of the Canadian section and himself, he wished to express deep appreciation of this recognition. He also thanked the Society for the compliment it had paid Canada in holding its fortieth meeting in Canada last year at a time when it was most difficult for British chemists to cross the Atlantic. It was a period of great anxiety for the chemical industry; there were difficulties in connection with the conditions of trade; labour and transportation were calling for close attention, and new legislation of vital interest to chemical industry was pending or being applied. The holding of the meeting last year in Canada and the United States, however, had the most far-reaching effects, and had done much to stimulate interest in chemistry and its industrial applications throughout Canada and the United States. The Society fully realised its objective in bringing into closer relations with the parent Society the far-flung sections of the North American continent. An important result was the appointment of a committee whose task it was to organise meetings of chemists in Canada, and the first of such meetings was held a few months ago, and was attended by more than 100 chemists.

Another feature of the meeting in Canada and New York last year was the manner in which attention was directed to the international value of the science of chemistry, in helping to link England more closely with the Anglo-Saxons of the American continent, and there was little doubt that the prestige of the Society had been enhanced and the interests of chemists consolidated.

Development of Research

He had ventured, perhaps rashly, to select as the chief topic of his address some aspects of the rather worn topic of scientific and industrial research. Members of the Society of Chemical Industry did not require to be reminded of the value and potentiality of science to the civilised community, and still less of the importance of expanding its boundaries and its applications to industry. These were obvious truths to every thoughtful man, but it must not be forgotten that the most obvious truths were those that required the most frequently to be recalled. He had no intention, however, of worrying an audience so largely composed of chemists by reminding them of how chemical science had contributed to the material and intellectual welfare of humanity. That had been done well and often before, and what he proposed to do was to discuss the present general trend of the development of scientific and industrial research, refer to the international organisation of science, treat in outline the post-war developments in the overseas dominions in applying science to industry and draw some tentative conclusions regarding the relation of the State to this wider problem. We were living in an age of a second renaissance, one which would leave an impression on the civilised world as that left by the great revival of literature and art in the fifteenth and sixteenth centuries. It was a renaissance in which the attention of the civilised world was concentrated on science. At the close of the war, the world was ringing with appreciation of what science had achieved. How best to develop this great power in time of peace, became an international as well as a national problem of the first magnitude. Its influence had penetrated to the industrial, political and scientific aspects of life and the general desire for co-operation and co-ordination had taken definite form in the League of Nations.

International Research Council

On the scientific side, this same spirit had called forth the formation of the International Research Council, which was established in Brussels in 1919, and the second meeting of this organisation had been called for the end of the present month in Brussels. He would like to give a brief statement of what this International Research Council was, and what it might become. It drew its delegates from representative councils and scientific bodies of the Allied and neutral nations and had definitely banned the Central Powers of Europe, although there was a division of opinion among the peoples of the neutral nations as to the non-recognition of Germany. Affiliated with this Council were a number of unions representing all branches of science, among which the International Union of Pure and Applied Chemistry was one of the most active, influential and thoroughly organised. In this Research Council there was no clashing of interests, and under Dr. Schuster, as honorary secretary, it had been carried to a stage of development at which it was a nucleus around which might gather all the scientific organisations of all the Allied and neutral countries with their various colonies. It had great possibilities in the future. The ultimate aim was to make it a veritable parliament of science with delegates from all countries. Such a world-wide organisation of pure science was a type of internationalism which was strictly democratic, and, if developed properly, would bring us nearer to the unification of mankind than any form of internationalism hitherto suggested, the underlying principle being the universalism of science and the catholicity of truth. This development, however, could only come about by each individual nation increasing the efficiency of its own industries by the greater application of science, and development in the Empire in this respect had largely been modelled on what had been done in Great Britain. The industrial research associations in Great Britain, although they had received criticism, had had an influence throughout the whole English-speaking world. The policy of industrial secrecy which had so greatly hampered the application of industry to science, was now almost obsolete, and it had been proved that for most industries the closed door shut out more than it shut in. The scheme of industrial research associations, however, was not so easily applicable overseas, but it had been fully recognised in the colonies and in the United States that co-operation in research and the application of the results to industry were the most effective means of making science commercially useful.

Co-ordination in the Colonies

In Australia an Advisory Council of Science and Industry had been formed which had taken in hand the work of investigating and co-ordinating the existing facilities for research. The result of that inquiry was to disclose a great shortage everywhere in the supply of trained investigators and certain steps were taken to encourage students to take up the work in order that the supply of trained investigators might be increased. By the end of 1918 similar steps had been taken in India, New Zealand, South Africa and Canada. The attempts that were made in Australia to use the existing university laboratories for industrial research work, however, soon showed that this was impossible, and a Government supported scheme for a Central Research Institute was put forward, the idea being that this Central Institute, assisted by State funds, should work in co-operation with the six other States and a scheme developed for industrial research organisations on the lines of the British scheme, there being attached to it a bureau of scientific information, and a technical and scientific library. The Industries Advisory Board was established by Act of Parliament in 1916 in South Africa and that Board had strongly recommended a Central Research Institute assisted by State funds. In the meantime, there had been established at the University College, Johannesburg, a laboratory in connection with the study and development of ceramics, but this was not to prejudice the establishment of a Central Institute later on.

The New Zealand Institute, which was similar to the British Science Guild, had approached the New Zealand Government with a similar scheme which involved a cost of £20,000 for five years, but it was felt that such an expenditure would not be justified in present conditions. In India there was the Indian Industrial Commission, which was appointed in 1916 under Sir Thomas Holland, and reported in favour of some

steps being taken whereby the State would assist the development of the industries of India. There had been established an Imperial School of Mining and Geology; a Central Chemical Research Institute and an Imperial Tanning Institute and Administrative Leather Factory. Progress, however, had been hampered partly owing to financial stringency and partly on account of political unrest, whilst the matter had been still further complicated by changes in the Government. The conditions in India differed from those in Australia and Canada, and the development of industrial and scientific research there must be linked up with the Indian Civil Service and be largely bureaucratic. Support from the Indian people seemed unlikely until the intelligentia and native races with their great wealth lost their prejudice against all forms of business.

Canadian Organisation

In Canada the organisation of scientific and industrial research was moulded more closely to that of Great Britain than any other. A special Committee of the Privy Council was established in 1916, and later, an Honorary Advisory Council for scientific and industrial research, which had eleven representatives of scientific, technical and industrial interests, with an administrative Chairman who gave his whole time to the work and received a salary of £2,000 a year. As instancing the work that was being done, Dr. Ruttan said that this year fifty of the most brilliant men at the universities were being assisted, and the majority of them were chemists or chemical engineers. This Advisory Council assisted the Government with advice and special grants, and gave financial assistance to special researches. It was recognised that the linking up of science and industry could only be brought about by some central organisation; that was the conclusion arrived at in Canada, and also independently in the other self-governing colonies. In 1917 this Advisory Council in Canada submitted a scheme for the formation of a Central Research Institute for Scientific and Industrial Research, and the scheme was supported by all the Boards of Trade, the Canadian clubs and the scientific organisations. The Bill was submitted to the Canadian Parliament last year, and the National Canadian Research Institute was approved by the Cabinet and passed by the House of Commons without a division, but owing to an unexpected attack of economy on the part of the Senate, the Bill was postponed, but the Government made a grant of £20,000. When formed, the Central Institute would be the Bureau of Standards of Canada, similar to the Bureau of Standards in Washington or the National Physical Laboratory in England. It would carry on fundamental research in physics, chemistry and related problems; there would be a director and eight or ten heads of departments carrying out independent research, who in turn would have trained assistants. There were also being established in Canada a number of industrial research associations or trade guilds, which would pay their own specialists and be housed in the Institute which would provide the necessary facilities without rental, the only charge being for power and materials at cost price. The laboratories would be placed at the disposal of individual firms for the study of processes in a similar manner to that in operation at the Mellon Institute at Pittsburgh, but instead of the Institute being maintained by private funds, it would be endowed by the Government At the same time, it would be free from the influences of party politics.

Industrial Research Institutes

In connection with this idea of central research institutes maintained by Government funds, Dr. Ruttan referred to the possible position of the industrial research associations in this country when the period of maintenance by means of grant expires, and asked whether the same type of research, for the benefit of all, rather than for any one particular industry, in the immediate future, would continue then to be carried out. In other words, he suggested the possibility that the research associations would then concentrate on real industrial research from which practical results could be foreseen within a reasonably short time, rather than more abstract research from which results were not immediately likely to be forthcoming. In this connection he quoted a statement made recently by the chief engineer of the du Pont Co., which, he said, put industrial research in its real place. According to this statement, industrial research must justify itself in economy of production. The prime object of business was to make money and, if research work was to maintain its proper place in business, it must be conducted so that it would more than pay its way. That was a clear business statement from a firm that spent over £40,000 a year on their various works laboratories and it could not be expected that a firm would jeopardise its financial standing for the attainment of an academic ideal. Five years had been put as the earliest date at which any appreciable results could be obtained from an industrial research laboratory and that real industrial results could not be looked for in less than ten years. Consequently, it was only to be expected that industrial research on the part of firms would take the form of researches into problems which could be solved at once and not problems which were for the future welfare of the nation.

The attempts to bring about co-operation among firms in industries for the purposes of research since the war had met with but qualified success, and, except in isolated cases, the universities had not proved of any great practical value to manufacturers. That had been the experience in America. Most industrial problems required continued study by the same investigators over a long period of time. Such conditions in the university laboratories were undesirable and rarely possible. Moreover it was often desirable that the inventor of an industrial process should carry it on until the practical commercial stage was reached, and the universities should be left free to feel that they held their technical equipment in trust for the community.

Functions of the University

The university should be chiefly the training ground for research men, and the establishment of central State research institutes would make for increased efficiency in the universities by creating an *esprit de corps* which should bring about rivalry and increased efficiency, and at the same time offer an attractive career for research workers by encouraging research on the borderline subjects in which progress in recent years had been so remarkable. It was true that a few of the more far-sighted industrial laboratories in America were dealing with more abstract problems, and papers on such subjects had come from the laboratories of the General Electric Co. at Schenectady and the Eastman Kodak Co., these papers dealing with such subjects as the constitution of matter and physics and physical chemistry. In Great Britain, he foresaw great possibilities for the National Physical Laboratory taking over these subjects, however, when the period of five years had elapsed for the grant to the industrial research associations, after which time he believed the industrial research associations would concentrate on problems requiring immediate solution. Much work of this nature in Great Britain could be carried out to-day in a State institute, but any such institute must have popular support and its work understood and appreciated by the public. It was only when this work received more general appreciation on the part of the public that abstract science would receive more support. Abstract scientific research now called for a much greater measure of State assistance, and should become one of the accepted responsibilities of the State.

Vote of Thanks

Dr. E. F. Armstrong, F.R.S., proposing a vote of thanks to the President for his address, said he had a confession to make with regard to the Council. A year ago, when the Council suggested to the Society that they should elect Dr. Ruttan as President, they had an ulterior motive. They wished to honour Canada and Canadian chemists, and they wished above all to honour Dr. Ruttan, and in asking him to accept the office of President, it was with the hope and wish that they would learn something from him during his year of office. Dr. Ruttan had given them some very solid meat indeed in his Presidential address, and as solid meat required digestion, he would ask the President, on behalf of the Society, if he would allow the address to be printed in the Transactions, so that they would all have an opportunity of digesting it at leisure. They had all often heard lectures on the neglect of science, but this was almost the first time that they had heard something about the other side of the picture, of the steps that were being taken throughout the Empire and in the mother country to promote science. It would be some years before these steps materialised, but they must be all to the good. Dr. Ruttan had given in his address a picture of what was being done throughout the Empire

in this very necessary direction. It was difficult, merely listening, to gather all that one would wish to gather, but he could not help feeling that there was going to be a good deal of bureaucratic control about research in the future. If bureaucratic control was the best way to do research, all would be well, but he wondered! It was, however, with very great pleasure that he proposed a hearty vote of thanks to Dr. Ruttan for his address. The vote was carried with acclamation.

Messrs. Price, Waterhouse and Co., were re-elected auditors.

The President expressed the high appreciation and sincere thanks of the Society to the Council of the Institution of Engineers and Shipbuilders for the hospitality afforded in allowing the use of their building in connection with the meetings.

An adjournment was then made for an informal luncheon, on the invitation of the Glasgow Section of the Society.

Annual Meeting of the Colour Users' Association

Mr. Sutcliffe Smith on the British Dyestuffs Industry

PRESIDING at the annual meeting of the Colour Users' Association, held at the Milton Hall, Manchester, on Tuesday, Mr. H. Sutcliffe Smith said that during the past year there had been no less than 64 council and committee meetings, the chief matters under consideration being the importation of Treaty Option colours, applications for licenses, and the many difficulties arising out of the Dyestuffs (Import Regulations) Act.

Reparation Colour

The total quantity of colour imported under the Reparation arrangements up to May 31 last, continued Mr. Smith, was 4,772 tons, of which 4,053 tons were imported prior to April 30, 1921. It would, therefore, be realised that the great bulk of the Reparation colour was imported from the stocks actually in Germany at the date of the coming into force of the Peace Treaty, and only 719 tons had been imported from current production during the year ended May 31 last. The full privileges under the Treaty Option were not being exercised. On the basis of the first four months of this year's output of colour (exclusive of intermediate products) of the German works, this country was entitled to approximately 450 tons per month, or 1,400 tons per quarter, whereas, during the quarter ended June 30 last only approximately 200 tons had been ordered.

Choice of Colours

The selection of colours obtained under the Treaty Option was made, in the past, by the Board of Trade, which requisitioned the quantities and types for delivery in quarterly periods; during the past year, however, the Association had co-operated with the Board of Trade, and members were periodically asked to furnish particulars of their estimated requirements for inclusion in the requisition. Some diffidence was shown by members in submitting such details; no responsibility was incurred by members in submitting such particulars, and there was no obligation to take up any portion of such colours as might have been included in the requisition on their recommendation.

In importing German colour under the Treaty Option, said the chairman, due regard must be had to the establishment of the dyemaking industry in this country. From a perusal of the import figures, it seemed obvious that the utmost advantage was not being taken of the facilities afforded by the Treaty Option to import such colours as were not made in this country, at specially advantageous prices, without in any way detrimentally affecting the British colour-making industry. The total importations of dyes and dyestuffs obtained from coal tar for the two years ended 1921 were 12,816 tons, whereas during the same period the importation of Reparation and Treaty Option colour was, approximately, 4,700 tons, leaving a margin of 8,000 tons, the great bulk of which could now be imported under the Reparation arrangement with great advantage to the country. During the five months ended May 31 last the imports of dyestuffs, according to the Board of Trade returns, were: Alizarine and anthracene, 328 tons; synthetic indigo, nil; and other sorts, 746 tons, making a total of 1,074 tons.

He had no definite information as to the importations of Treaty Option colour during the same period, but it might be assumed that it did not exceed 200 tons.

From the figures showing the volume of imports from foreign makers it would be realised that there was yet a great gap to be filled in the production of colours essential to the textile industry, and pending the production of these colours by British makers.

Dealing with the Dyestuffs Act, Mr. Sutcliffe Smith said that if it were withdrawn to-day, without further safeguards, there was not a shadow of a doubt that the huge German trust known as the "I.G." could very shortly smash the British industry; but to take advantage of such temporary cheap prices would be a very short-sighted policy, as the German makers would then have the textile trade at its mercy so far as colour was concerned, and could charge any price they desired as they were now doing with any special colours which have to be directly imported.

High Price of Dyes.

After referring to the work of the Dyestuffs Advisory Licensing Committee and the Technical Advisory Committee of the Association, Mr. Sutcliffe Smith dealt at some length with the price of dyewares. This, he said, was far above the general economic level of commodity prices in this country, and it was felt that the time had arrived for a concerted effort to obtain a reduction in these prices. Not only had home production prices been high, but the prices of colours imported from abroad during 1920 and 1921 in comparison with 1913 had shown an extraordinary increase, as the following figures demonstrate:—

Import of Dyes and Dyestuffs, taken from Board of Trade Returns.

	1913. Av. price per lb. Pence.	1920. Av. price per lb. Pence.	1921. Av. price per lb. Pence.
Alizarine and Anthracene..	9·6	97·9	29·6
Indigo, Synthetic	6·9	44·0	32·2
Other Sorts	11·7	84·2	66·7

He was of opinion that had it not been for the competition of British makers, still greater prices would have been charged to them for their foreign wares.

The question as to whether any difference in price between the foreign supplier and the British maker was to be deemed sufficient reason for the granting of a licence was now under the close consideration of the Licensing Committee, and if a definite basis could be agreed upon between the makers and users, it would have a tremendous bearing upon the prices of dyestuffs.

British Dyestuffs Corporation

Having in view what transpired at the recent meeting of the British Dyestuffs Corporation, the Chairman said he had no desire to reopen any contentious matter, but there were a few points germane to them as users which should be mentioned. He was glad to hear that the directors of British Dyestuffs Corporation were fully alive to the necessity of continuous research. We had by no means reached finality of discovery in chemistry, particularly organic chemistry, and it would be a national calamity if we had not the training-ground in this country for those young chemists to whom we looked for the discoveries of the future.

Sir William Alexander had said it was essential that we should establish a dye-making industry in this country adequate to our needs both in peace and war, and he (Mr. Sutcliffe Smith) thought that there was no user of any standing in the whole country who would not endorse that statement. It is essential that Germany should understand and appreciate that Sir William Alexander, in making this statement, carried with him the unalterable determination of the Government and of the nation, despite the enormous difficulties and many obstacles, eventually to establish a dye-making industry here commensurate with our full needs for both peace and war. Having in mind our natural advantages for raw materials, transport

facilities, etc., coupled with the brains of our chemists, which were equal to those of any nation, he felt sure, given a fair chance, that the manufacturing of dyestuffs in this country on a proper scale could efficiently be established.

He believed that in the present chairman of the British Dyestuffs Corporation they had, for the time being, the right man in the right place; but he still thought that unless the Corporation took to heart the suggestions which he threw out at their annual meeting, no substantial progress would be made in the production of adequate quantities of suitable types of dyewares at an economic price.

The suggestions put forward by Mr. Sutcliffe Smith were: (1) That the Government should wipe out their loan to the Corporation; (2) that the Corporation should face a scheme of reconstruction; (3) that the directors should eventually see their way to arrange that the Corporation shall be managed by men who have been brought up in the industry, on the lines of the big textile associations.

In conclusion, the Chairman said the British Dyestuffs Corporation had a hard task before it, and needed all the advice, help and support the Association could give it. In the meantime a real peace was needed in the dye industry. They must help to create a new atmosphere, and, collectively and individually, sympathetically co-operate with and help the British makers by all the means in their power to enable them gradually to build up a great industry.

The Annual Report

In presenting their report for the year ended April 30 last, the Council of the Colour Users' Association state that the Association has made highly satisfactory progress, and many subjects of supreme importance to the colour-using industries have been dealt with during that period. The Council is appreciative of the fact that the Association is recognised officially by the Government as the representative body of colour users. The unparalleled period through which the colour-using trades have been passing, states the report, has reflected itself in the scope and utility of the Association. When the year opened, the textile trade was in the throes of a slump never before experienced by anyone now in the trade, and the worst had not yet been reached. Fortunately there are signs of a slow recovery, and it is felt that the Association can be of immense assistance to its members in helping to rehabilitate trade, particularly in securing adequate and proper supplies of colour.

At April 30 last, the membership was 240; five new members having been added during the year, and 34 having resigned. The colour consumption of the members is, it is estimated, approximately 90 per cent. of the total colour used in the country. In addition to the Council re-elected at the last annual meeting, the following gentlemen have, during the year, been co-opted as members:—Messrs. Thorp Whitaker, G. E. Holden, C. Roberts, W. E. Kay, James Ewing, W. H. Dixon, and C. W. Wade. Mr. H. Sutcliffe Smith was appointed Chairman, and Mr. Henry Allen kindly consented to remain as President of the Association.

Dyestuffs (Import Regulation) Act

Prior to the passing of the Dyestuffs (Import Rgulation) Act, the Government pledged itself to bring about the establishment of the dye-making industry in this country "without placing the textile and other colour-using industries in an unduly disadvantageous competitive position," and on this assurance the principal users, through this Association, then agreed to the imposition of the Act. That Act has now been in operation for over a year, and the Association, through its representatives on the Advisory Licensing Committee, and its Technical Advisory Committee, has endeavoured to assist its members in guarding their interests and in maintaining their full privileges under the Act. Four of the five user representatives on the Advisory Licensing Committee were nominated by the Association (Messrs. George Douglas, T. N. Grant, C. C. Railton, and Thomas Taylor), and the Council wish to record their full appreciation of their services.

Application for Licences

Several conferences have been held throughout the year between the user representatives on the Advisory Licensing Committee and the Council, to consider and advise as to procedure for making applications for licences. Various circulars have been issued to the members on this subject, and the final recommendations of the Council were embodied in a circular to all members issued in October last. The Council wish specially to record their appreciation of the wholehearted and untiring assistance rendered to them by Mr. G. E. Holden, in his capacity as honorary technical adviser to the user representatives. The applications for licences, numbering upwards of 5,000, have been reviewed by Mr. Holden, assisted by other members of the Technical Advisory Committee, before submission to the Advisory Licensing Committee, in order that the merits of each case from the user's point of view might be properly set forth.

Importation of German Colours

Under the Peace Treaty 25 per cent. of the German production until the end of 1924 is placed at the disposal of the Allies, of which it is understood the proportion for the United Kingdom is 30 per cent., or about 8 per cent. of the German production. The selection of colours obtained under this arrangement was made in the past by the Board of Trade, which requisitioned the quantities and types for delivery in quarterly periods. During the past year, however, the Association has co-operated with the Board of Trade, and members are periodically asked to furnish particulars of their estimated requirements of colours for inclusion in the requisition. Some diffidence has been shown by members in submitting such details, probably owing to their being under a misapprehension as to the responsibility for the stocks. It should be clearly understood that no responsibility whatever is incurred by the Association or its members in submitting such particulars, and there is no obligation on their part to take up all or any portion of such colours as may have been included in the requisition on their recommendation. The Council strongly urges all members in their own interests to take full advantage of the facilities thus afforded them of obtaining colours under the Peace Treaty.

Arrangements have recently been made for the deliveries of Treaty dyewares to be reserved entirely for the use of members of the Association for fourteen days after arrival, before being offered for general sale on the open market. The Board of Trade agents notify the Association on arrival of consignments of colour, and particulars are immediately sent out to the members who asked for the colours to be requisitioned. After seven days have elapsed all members of the Association are notified, and thus every member has an opportunity of purchasing any colours of interest before they are offered for sale to other users and dealers. This is a great advantage, and one which members will no doubt utilise very extensively as trade conditions improve.

Safeguarding of Industries Act

A great amount of work has been entailed arising out of this Act, and in order to safeguard the Association's interests a Vigilance Committee was appointed. Through the personal assistance of the chairman several conferences have been held with the Board of Trade, and it is gratifying to report that the negotiations have been highly successful. As a result of these personal interviews many of the obscurities arising under the Act as affecting the colour-using industries have been cleared up, resulting in considerable deletions of important chemicals from the Schedule accompanying the Act, which were subject to duty. These results have been obtained at no great outlay on the part of the Association. Negotiations are still proceeding on other debatable chemicals, and a further report will be submitted when a definite decision is obtained from the Board of Trade.

Development Committee

This Committee was appointed by the Board of Trade. Its primary object is to endeavour to secure the manufacture in this country of as large a field as possible of the dyestuffs required by consumers on the most economical basis, and within the shortest possible space of time, and it will advise the Board of Trade as to the steps which it is considered should be taken to attain this end. The Association nominated three representatives (Messrs. W. H. Dixon, George Douglas, and Thomas Taylor). The Committee had not had many meetings throughout the year. It has already prepared a list of dyestuffs manufactured in Great Britain, together with their foreign equivalents, and this list is now being considered by the Technical Advisory Committee of the Association.

Safeguarding of Industries Act

The Boric Acid Award

As briefly reported in THE CHEMICAL AGE last week, the Referee's award in regard to "Acid, Boric" removed this substance from the lists of articles chargeable with duty under Part I of the Safeguarding of Industries Act as from June 29.

In his decision the Referee stated that the complainants based their case against the inclusion of boracic acid in the list of dutiable substances upon trade usage. They contended that there had been such a general classification or acceptance of boracic acid as a heavy chemical as to make further consideration unnecessary and irrelevant. Four chemical merchants of experience said they had always regarded boracic acid as a heavy chemical: three of them went further and said it had always been treated and regarded in the trade as a heavy chemical. Mr. Parry said the same thing. Until a few weeks ago the view of Mr. Johnson, the sales manager of Borax Consolidated, Ltd. (controlling and selling 85 per cent. of the boracic acid sold in this country) was that boracic acid could in no sense be regarded as a fine chemical.

Evidence on Classification

On the other hand, five or six witnesses were called who expressed the opinion that boracic acid was a fine chemical but not one of them said that it had been so classified or treated by the trade. The witnesses for the complainants were supported by the evidence to be derived from trade journals. It was in my opinion established that trade literature has consistently referred to boracic acid as a heavy chemical. Further, the report issued by the Department of Overseas Trade on the market for heavy chemicals in the Argentine Republic dealt with boracic acid as a heavy chemical. He was satisfied, and found as a fact, that boracic acid had not been generally regarded as a fine chemical in the trade.

The complainants further relied upon the following contentions:—(*a*) That the scale of manufacture was undoubtedly large for a fine chemical. This was emphasised by Borax Consolidated, Ltd., in their abandoned complaint. (*b*) That about one-fifth of the boric acid consumed in this country came from Italy, and that whatever might be said of the difficulty of manufacture here, the method of production there certainly did not tend to stamp boracic acid as a fine chemical.

Although criticised at a later stage, the evidence of Mr. Funajoli was not seriously challenged in cross-examination, and the Referee is satisfied that the production in Italy is simple and does not require that skill and expert supervision which is usually associated with fine chemical production.

The Board of Trade put in a counter-statement, their reason for the inclusion of boracic acid in the list being that 80 per cent. of the total consumption in this country was absorbed for medicinal and surgical purposes, and that a considerable quantity was used for food preservation purposes and only insignificant amounts in industry. It was clear that the Board had been misinformed as to the facts.

Supervision of Manufacture

At the hearing, the opponents relied also upon the method of manufacture in England, contending that it required that skilled supervision which was one of the indications that the product was a fine chemical. The Referee states that he was not at all convinced by the evidence on this point. Dr. Bassett certainly said that the operations to prepare boracic acid were extremely complex and required very careful supervision, but when asked what part of the operation was complex he answered that one stage might reasonably be called complex, the stage where arsenic was removed.

Having carefully considered the evidence, and bearing in mind the fact that difficulty of manufacture was not put forward by the Board of Trade in the statement, and the attitude first taken up by Borax Consolidated, Ltd., the Referee's conclusion on the method of manufacture was that it did not help to weight the scales in favour of boracic acid being a fine chemical.

In conclusion, the Referee expressed the opinion that on the whole boracic acid was not a fine chemical within the Act, but whether he was right or wrong about that, he was quite satisfied that the position of boracic acid was at least so doubtful that it ought not to be included in the list of dutiable substances.

Glass Bottles Inquiry

THE complaint by the Association of Glass Bottle Manufacturers of Great Britain and Ireland, with regard to glass bottles imported from Germany and Holland (*see* THE CHEMICAL AGE, Vol. VI, page 735), has now been heard fully by the Board of Trade Committee which has been inquiring into it.

Since our last report further evidence has been given by importers of glass bottles, as well as by a number of users. The fear was expressed that the effect of the imposition of a duty on German and Dutch bottles would be to raise the prices of British bottles. In many cases the types of bottles required could not be obtained from British manufacturers, so that the only result would be an increased price to many users. It was alleged that British prices were inflated, and that the British manufacturers of glass bottles sought a monopoly.

Cost of Production

The whole of Thursday, June 29, was given over to the final speeches of counsel on either side. Mr. W. H. Inskip, K.C., M.P., for the opponents, directed criticism to the complainants' figures of cost of production in this country. These, he said, were averages compiled from the cost of production at a number of works, so that the efficient works were lumped together with the inefficient; also it was noticeable that the labour costs had doubled since the pre-war period, in spite of the fact that Owens machines were now used, and that it had been stated that the number of workers needed for the same output with Owens machines, as compared with hand methods, was very small. With regard to the prices given as being those at which German bottles were sold here, whilst admitting that low quotations were made by the German manufacturers, counsel pointed out that delivery was not obtained at those prices. The Germans always asked for advances when orders were given, and if they were not paid, delivery was not made. As to the suggestion that German competition was due to the disparity between the internal and external value of the mark, counsel contended that as the mark became stabilised this disparity would tend to disappear. He would not agree that unemployment in the glass bottle industry in this country was due solely to the depreciated exchange. It was due to a great extent to the trade slump in this country, which had commenced in November, 1920. Other factors which contributed to unemployment were the high British prices, the loss of export trade, and the introduction of up-to-date machinery. A duty on German bottles would throw many more workers in other industries using glass bottles out of employment than the British glass bottle industry could possibly absorb.

Sir Arthur Colefax, K.C., for the complainants, pointed out that the Act referred to "profitable" manufacture here, and not merely "manufacture," and, as to Mr. Inskip's criticisms of the complainants' average figures of costs, not one of the factories in question could have manufactured at prices below those averages, plus 10 per cent., which latter was in respect of profit. The figures given by the complainants did not include profit. Sir Arthur pointed out to the Committee, with regard to the suggestion that in the event of the imposition of a duty on German bottles, British prices would rise, that no advantage would accrue to the British industry if prices were raised. The manufacturers hoped to be able by reason of increased demand to utilise the plant which was now lying idle, and so reduce costs of production, and their profits would come in that way. Bottles were imported from other countries, with which the British manufacturers would still have to compete, and it was also uncertain as to whether the margin between the German costs of production and their selling prices in this country was sufficiently large to enable them to export to this country in spite of the duty. As to the statement that many industries could not get the bottles they required from British manufacturers, and had to go abroad, many of them were obtained from France and other countries, and the duty on German bottles would not affect them at all.

This concluded the proceedings, and the Committee's recommendations will be submitted to the Board of Trade in due course.

Policy of the Dyestuffs Corporation

Sir W. Alexander's Reply to Criticisms

SIR WILLIAM ALEXANDER, chairman of the British Dyestuffs Corporation, Ltd., addressed a meeting of the Commercial Committee of the House of Commons on Wednesday, in reply to statements made before the same body by Dr. Levinstein, who recently retired from the board

Sir William said the charges made by Dr. Levinstein appeared to be, first, that the Corporation had been subject to direct control by the Government, and, secondly, that there was something wanting in the technical direction. With regard to the first point, there had never been, in his experience, anything remotely approaching Government control. It was true the Government were large shareholders, that they nominated two members of the board, and that the late chairman and his predecessor were Government nominees, but it was untrue that the Government had ever exercised any control or influence in the detailed control of the business. As he understood it, the interests of the Government were twofold: to secure the establishment of the industry in this country by those means which could properly be used by a Government, and to see that any international arrangement which might be made between the British industry and any other should include adequate safeguards for the protection of the interests of the British Empire. With regard to technical direction, if it was meant that the executive control of a dyestuffs undertaking must be vested in a person of widespread technical knowledge in that industry, he did not himself hold such knowledge necessary. An administrative post must be filled by one of administrative ability; it was a question of personality.

Place of the Administrator

If they looked at the dyestuffs companies abroad they would find in one a financier, in another a commercial man, and in a third a technical man at the head. These men did not occupy these posts because of their financial or commercial, or technical knowledge, but because of their administrative skill. He contended that the changes which had been made in the direction of the Corporation were justified, and that the Corporation was already in a better position. His policy would be to proceed slowly and with caution. He was concentrating effort on producing the dyestuffs they were already making of the highest possible quality. What they were doing he wanted to do extremely well. Instead of rushing to place dozens of new colours on the market in a short time, he would not let any new colour be manufactured until the highest pitch of perfection was reached. Once the user knew that the Corporation's products were of good quality he would view their efforts with greater confidence. He believed if they were permitted to develop on these lines they would create an organisation which would be of real use to consumers in times of peace, and an important element during war.

Replying afterwards to a number of questions, Sir William Alexander said they could not expect to do in a few years what Germany was doing after 40 years. Germany had found short cuts in production, and had obtained efficiencies which could be obtained only after long experience. They knew the formulæ of the bulk of the German dyestuffs, but formulæ did not produce dyestuffs. It was a question of manipulating plant and of the human element.

International Liquid Fuel Congress

UNDER the auspices of the Société de Chimie Industrielle, an international congress on liquid fuels will be held in Paris, in October, when Professor Sabatier is expected to preside. The subjects for discussion include the terminology of petroleum products, and tests and analyses. It is proposed that each nation shall be at liberty to retain its own system of nomenclature and methods of analysis, but that in every case the exact connotation of the terms employed shall be clearly defined. The subject will be divided into the following six sections: oil-shales, lignite and peat, tar and benzol, alcohols, and vegetable oils; and there will also be an exhibition of petroleum products and appliances. Suggestions concerning the proposed agenda, etc., will be welcomed by the Société.

Alby United Carbide Factories

Official Receiver's Comments

ON June 30, before Mr. H. E. Burgess, Senior Official Receiver, the statutory meetings were held under the liquidation of the Alby United Carbide Factories, Ltd. (*See* THE CHEMICAL AGE, Vol. VI, p. 315.)

The Official Receiver said the statement disclosed gross liabilities in regard to creditors amounting to £643,678, of which £467,260 was expected to rank for dividend. The net assets amounted to £51,853, and the deficiency with regard to creditors was returned at £415,406. In regard to contributories, the paid-up capital of the company amounted to £2,301,728, and the total deficiency £2,717,135. The company was originally registered in 1905 to acquire the assets of a company then in liquidation. He could not understand how it was that out of 12,500 shares offered to the public Mr. Barton was to receive, as promoter, 10,000 shares by way of commission. There was some question as to whether the transaction could now be set aside, but he would strongly recommend the liquidator to look into that contract and see whether anything could be done.

Further issues of shares were made at different dates, and in November, 1919, at the date of the amalgamation with the Nitrogen Products Co., the capital exceeded £2,000,000. The company's business was at first confined to the acetylene plant, but in 1906 it commenced to manufacture calcium carbide at Odda, Norway. Under an agreement, dated Febrary 27, 1912, the Tyssefaldene Co., of Norway, contracted with the company to supply power for the Odda works for 30 years. That was a most remarkable contract. There was no knowing what power might cost in 30 years time. In this case the rental latterly had amounted to £113,000 per annum, the rent being secured by a charge on the company's works, and, curiously enough, the company's works were situated on the power company's land.

Sale of Odda Works

He noticed that Mr. Barton was also interested in the Tyssefaldene Co. It might be that the Alby Co. did not receive independent advice, but at all events that contract was the immediate cause of the company's failure. The Alby Co.'s works were put up for sale by auction and, there being no bid, the Tyssefaldene Co. secured them for £1,940—works which had cost the Alby Co. £500,000.

The Tyssefaldene Co., in addition to getting the Alby Co.'s works, which had cost over half a million of money, had also sent in a claim for £163,000. He intended to reject their proof until he had received further information respecting it.

The company contracted to supply the Nitrogen Fertilizers, Ltd., with 57,000 tons of carbide per annum at £4 17s. 6d. per ton for a period of 30 years. The benefit of this contract passed to Nitrogen Products Co., Ltd., but owing to the war the cost of manufacturing carbide rose to about £20 per ton, and in the interest of both companies an amalgamation was decided upon.

The chief asset of the Nitrogen Co. was an interest in Aura—a company registered in Norway. He believed it had some concession, under which it was allowed to use a large waterfall, which was to supply power for electric current. The Aura Co. had had a considerable sum of money spent upon it, in fact, about £1,000,000. Since the Alby Co. acquired it they had spent £200,000 on it, and it had not been completed yet.

The failure of the company was attributed to the falling off in the demand for carbide and to inability to manufacture, except at a loss. The creditors nominated Sir W. B. Peat as liquidator, and the shareholders by a majority nominated the Official Receiver. A committee of inspection was also appointed, consisting of representatives of the London City and Midland Bank and the Ministry of Munitions on behalf of the creditors, and Mr. King and Mr. A. I. Taylor on behalf of the shareholders.

Warrants of Appointment

WARRANTS of Appointment to His Royal Highness the Prince of Wales have been granted to Bryant and May, Ltd., John Knight, Ltd., Lever Brothers, Ltd., A. and F. Pears, Ltd., Reckitt and Sons, Ltd., and the Vinolia Co., Ltd.

Oil Refining at Swansea

Anglo-Persian Company's New Enterprise

MR. STANLEY BALDWIN, the President of the Board of Trade, on June 29, formally opened the new refineries erected at Llandarcy at a cost of nearly £3,000,000, for the treatment of crude oils imported by the Anglo-Persian Oil Co., Ltd. Built for the National Oil Refineries Ltd., an associated organisation of the Anglo-Persian Oil Co., the new refineries cover an area of about 650 acres, and have accommodation for the storage of approximately 25,000,000 gallons of oil.

Sir Charles Greenway (chairman of the company) said the refinery had actually been working since July last, but as only a part of the works was in operation it was deemed desirable to delay the opening ceremony until the full refinery was in operation. During the interval they had already produced something like 500,000 tons of refined products. That day's ceremony chronicled the establishment in this country of what was in effect a new industry—the refining of imported crude oil. The refining in this country of imported petroleum had been carried on in a small way for some time past, but it had been chiefly confined to the redistillation of partly refined products and to "topping" crude oils which contained only a very small proportion of light distillates. Theirs, however, was the first refinery to be erected in this country to deal with imported crude oils on a large scale, and to produce from those oils all their various derivatives—such as aviation spirit, petrol, paint, and dyeing spirits, kerosine, gas oil, lubricating oils, liquid petroleum, wax, fuel oil, pitch, etc.

So well satisfied were they with the results so far obtained that they had already decided to increase the capacity of the refinery by 50 per cent., and they had already placed orders for the necessary additional plant.

Importance of Research

One of the national advantages attached to the opening of the new refinery, continued Sir Charles, was the provision of remunerative employment for a large body of scientists and technicians. The world was apt to forget that the petroleum industry owed its very existence to the discoveries of Britons, and that, had it not been for the splendid research work of Young, Meldrum, and Binny, first of all in Derbyshire about the year 1857, and later on in Scotland, it was doubtful if the commercial utilisation of petroleum would have advanced to anything like the extent that it had, or the industry have become the important one that it was to-day. It was the success which attended those men's discoveries that first drew attention to the possibilities of petroleum in the United States, and Dr. Young's patents were indeed the foundation on which the great American oil industry of to-day was built. The study and research work that was then begun by these men had been carried on ever since by the Scottish shale oil companies, by the Burmah Oil Co., and by other British concerns and investigators, and the refinery they were opening that day would demonstrate to every petroleum expert present that they were still in the van of the industry in its technology and in its commercial application.

They had established a very complete laboratory at Sunbury, in Middlesex, at which a number of eminent research chemists were continuously engaged in the study of the numerous problems connected with the commercial utilisation and the improvement of quality of the many products of petroleum. It was, perhaps, needless for him to say that the world's knowledge on the subject of the many derivatives of petroleum was still very incomplete, and in that direction there was still a vast field for the research work of their chemists.

Chilean Market for Caustic Soda

As the manufacture of soaps in Chile has assumed considerable importance during recent years, and the price of caustic soda has been sufficiently reduced to make importation possible, a good market is said to exist for this commodity in Chile, both in wholesale quantities and in smaller packages. The latest statistics, published in a recent issue of *Commerce Reports* (Washington, D.C.), show that there are 29 soap factories in the Republic, with an invested capital of 6,208,209 paper pesos, and with an annual production of about 9,000,000 kilos, valued at 11,000,000 paper pesos. These factories, with other Chilean industrial enterprises, such as paper mills, cotton factories, etc., which use caustic soda in their various processes, purchase either directly or through large importing houses from manufacturers in both the United Kingdom and the United States. In 1920 the United Kingdom was by far the largest supplier of caustic soda, supplying to Chile 896,370 kilos. The United States came next, furnishing 367,758 kilos., followed by Japan with a total of 31,750 kilos. The Netherlands was the only other source of supply with 24 kilos. Chilean manufacturers have been accustomed for many years to purchase supplies from the United Kingdom, and strong efforts should be made by our own manufacturers to retain and extend, if possible, their share of the trade, as American exporters are now busy with a good selling campaign, and are making energetic endeavours to increase the sale of their product. The caustic soda entered through the port of Valparaiso is usually in drums of 306 kilos., and is destined for use in the Valparaiso-Santiago factory district. In the southern Chilean ports, such as Valdivia, Talcahuano and Punta Arenas, many smaller-sized packages are brought in for the use of the large plantations in making lye, soft soap and cleaning solutions. There is no market for lye in liquid form.

The German Potash Situation

Improvement in Sales Reported

THE *Deutsche Bergwerks Zeitung* of June 23, an extract from which has been forwarded by the Commercial Secretary at Cologne to the Department of Overseas Trade, reports that at the general meeting of the works belonging to the Burbach concern, held on June 22, the Chairman made the following statement concerning the present position of the German potash industry:—

"The sale conditions of the potash industry have considerably improved during the past year. The sales during the first five months amounted to 561,000 tons K_2O as against 338,500 tons K_2O during the same period last year, an increase, therefore, of 60 per cent. These favourable sales concern principally manufactured goods; in raw salts, business is moderate. For the current and following months a favourable result appears to be assured, as the Potash Syndicate has many orders on hand. The potash industry presents at present the unexpected and astonishing feature of potash works being unable to fulfil the current orders in manufactured goods. As a consequence, in closing down works, particularly those with manufactured goods, the greatest care should be taken, and the period, until April 1, 1923, for the voluntary closing down of works is considered much too short.

"The reasons for the increased sales are partly to be found in the growing insight in regard to the importance of potash fertilisation, the full recognition of which would insure, in spite of the Alsatian competition, the permanent prosperity of the German potash industry. The direct impulse to the present sale increase during the summer months, during which time sales are usually dull, was given by the Potash Syndicate in granting considerable discounts to agriculture and in obtaining special tariffs from the railways. The comparatively very high summer sale will, in the opinion of the speaker, mean a direct increased sale, as the orders otherwise placed during the autumn cannot as a rule be fully met on account of the truck shortage which always sets in. It was in consideration of this that the Potash Syndicate agreed to grant discounts, for the inland potash prices in themselves are not such as to allow of discounts. So far it has been possible to keep them low as they were balanced by the higher export prices. In view of this sound price policy it is impossible to understand the endeavours of the Government to lay a social export tax on the export receipts, which are already helping the inland prices, and further, it is very dangerous, for should this measure be carried out it would mean an increase of the inland prices with its consequent evils."

Graphite as Boiler Scale Preventive

TESTS are being made at the Southern experiment station of the U.S.A. Bureau of Mines, Tuscaloosa, Ala., to determine the efficacy of low-grade dust from Alabama flake graphite for preventing the formation of scale in boilers.

Lautaro Nitrate Company

Mr. J. O. Herrera on Prospects of the Industry

PRESIDING on Monday at the annual meeting of the Lautaro Nitrate Co., Ltd. and Reduced, held at River Plate House, Finsbury Circus, London, Mr. J. O. Herrera (chairman of the company) said the Association of Producers in Chile had practically stopped selling altogether, so that the company found themselves tied hand and foot, with enormous stocks of unsaleable nitrate, both in Europe and in Chile, which had absorbed all their available cash and reserves. Heavy acceptances for their commitments in Chile were falling due, and the general position of the nitrate market was very dark indeed. In these circumstances, the relief from the financial scheme, which the shareholders voted last year, came into action, and had proved quite up to their expectations. All financial difficulties had been overcome, and the syndicate formed by the shareholders who voluntarily joined, and which were subsequently formed into the Compania Consignataria de Nitratos de San Sebastian, had granted all the necessary financial aid, and had even gone beyond the advances stipulated in the provisional agreement of April 29, 1921. But if this financial scheme had worked perfectly in their business operations during a bad time, it had played havoc with their balance-sheet, and no doubt the shareholders had all been surprised at the figures of their profit and loss account, showing a gross trading loss of £473,667 on a turnover of 45,000 tons of nitrate. A careful examination of the profit and loss account and the financial scheme would disclose the real meaning of these abnormal and somewhat disproportionate figures.

Mr. Herrera said the latest nitrate reports estimated that the consumption for the year from July, 1922, to June, 1923, looked more favourable, and calculations admitted that one and three-quarters to two million tons might be exported, exclusive of Germany, Austria and Russia, which countries imported pre-war about 800,000 tons. On the above basis they should receive a quota of 50,000 tons, more or less, of which 30,000 tons might come into the current year's accounts. He could not hold out very bright prospects for this year, as the price fixed by the Association only left a moderate profit, but they were hoping it would encourage consumption, get rid of the excessive stocks in Chile, and pave the way for a general improvement.

Revised Prices for Sulphate of Ammonia

THE British Sulphate of Ammonia Federation, Ltd., have issued a circular in which they state that they propose to follow their usual custom of raising prices gradually during the remainder of the season, and to this end they have fixed their summer prices at a level considerably below what they are obtaining for export. The unit value for nitrogen in the prices stated below for neutral quality is about 15s. 4d., and corresponds to a price of about £11 18s. per ton for nitrate of soda. When the price of nitrate is £13 per ton at British ports, sulphate of ammonia is worth well over £18 per ton delivered. Taking into account the higher content of nitrogen, the greatly improved mechanical condition, and the inclusion of delivery charges, the Federation claim that their prices show no increase over pre-war figures.

The production of neutral sulphate of ammonia, the circular continues, is rapidly increasing, and we expect that the bulk of our deliveries will henceforward be of neutral quality, but we reserve to ourselves the option of delivering ordinary quality in some districts, subject to the allowances in price stated below. Owing to bad trade conditions, the total production of sulphate of ammonia, both here and abroad, is still much below normal, and it is essential that orders should be freely placed for summer and autumn delivery if the demand for the whole-season is to be met. Prices for September will be announced later. We offer to sell sulphate of ammonia for home agricultural use at the following prices :—For July and August delivery, 1922—£16 3s. per ton for neutral quality in fine friable condition, free from lumps, basis 25¾ per cent. ammonia. Limited quantities of ordinary quality will be available in some districts, and will be sold at 23s. per ton less than the above prices, basis 25¼ per cent. ammonia.

Neutral sulphate of ammonia as described above, guaranteed not to contain more than 0·025 per cent. free acid, will be sold on the basis of 25¾ per cent. ammonia, and with no charge if over 25¾ per cent., but with an allowance per ton of 3s. for each ¼ per cent. below the standard. A further allowance of 9s. 6d. per ton will be made should the content of free acid exceed 0·025 per cent., and an allowance of 9s. 6d. per ton will also be made should any delivery of neutral sulphate not be in fine friable condition free from lumps.

Ordinary sulphate of ammonia will be sold on the basis of 25¼ per cent. ammonia, with no charge if over 25¼ per cent., but with an allowance per ton of 3s. if the content of ammonia is under 25¼ per cent. but not under 25 per cent., down to 26s. if the content of ammonia is under 24 per cent. but not under 23¾ per cent. If ordinary sulphate is ground, pulverised, or otherwise rendered free from lumps at buyer's request, an additional charge of 7s. 6d. per ton will be made.

The above prices are delivered free, for prompt cash payment, in four-ton lots and upwards to buyer's or consumer's nearest railway station or wharf in Great Britain (or f.o.b. British port when the ultimate destination is the Isle of Man), and packed in single bags containing about 2 cwt. net to be supplied free by sellers, tare allowed. The maker will allow 10s. per ton if the buyer elects to take delivery by road vehicle ex works.

Soap Manufacturers' Losses

A CONFERENCE of the creditors of Sapon Soaps, Ltd., soap manufacturers, Wharf Road, Cubitt Town, London, was held on June 30, at the Cannon Street Hotel, London. The chairman of the company presided, and stated that the directors became aware last autumn that the financial position was very unsatisfactory. The company produced a good article, but the Board gradually came to the conclusion that the management had been deficient. His opinion was that the concern had been brought to its present position largely through the fault of the management, coupled with the difficulties which had arisen through the troublesome times which had been encountered. The directors finally decided to accept a suggestion and transfer the business to Liverpool, where it would be under the management of a well-known firm of soap makers, but the arrangement fell through. It became more and more difficult to carry on, and the directors found that further capital could not be obtained. The total liabilities of the company were about £63,000, of which £31,422 was owing on debentures. There were general creditors for £9,807 and contingent claims for £18,437. The latter included about £12,000 owing to an agent in America. A suggestion was made that a committee of the principal creditors should be appointed to work with the directors in the preparation of a scheme, and the chairman said he welcomed the suggestion, and would be glad to consult the principal creditors.

Sodium Phenate in Chemical Warfare

BEFORE the Royal Commission on Awards to Inventors on Monday, Professor H. B. Baker, of the Imperial College of Science, made a claim in respect of protection against poisonous gases in the late war.

Professor Baker said he discovered about the middle of June or the beginning of July, 1915, that a solution of sodium phenate was the best substance with which to impregnate anti-gas helmets. Cross-examined by Mr. Trevor Watson for the Crown, Professor Baker said he received a letter from the General Headquarters Laboratory in July suggesting sodium phenate, but he must have put it in his pocket and forgotten it. He agreed, after being shown the copy of a letter, that he had made a mistake in the dates, and that it was improbable that prior to July 7 he discovered sodium phenate. Colonel P. S. Lelean, of the Army Medical College Laboratory, said, in reply to Professor Baker, that he remembered a telegram being received from the Earl of Ypres, then Sir John French, stating that unless some protection was forthcoming from the enemy gas we should be in the Straits of Dover. Sodium phenate was the fifty-eighth substance that was tried. Mr. Trevor Watson, on behalf of the Crown, submitted that no award should be made. Before any experiment had been done on any animal the whole of this information was in the hands of the Anti-Gas Department from other sources. The decision will be announced later.

Chemical Matters in Parliament

Duty on Boric Acid

Answering Dr. Murray (House of Commons, July 4) Sir R. Horne said the amount of Key Industry duty collected in respect of boric acid during the period from October 1, 1921, to June 20, 1922, was £21.

Safeguarding Act Revenue

Mr. Hogge was informed by Sir Robert Horne (House of Commons, July 4) that the amount of duty collected on goods which had been subsequently removed from the Board of Trade lists, as from October 1 last, was £11,447.

Refund of Duty

Sir J. Baird informed Mr. C. White (House of Commons, July 3) that under the provisions of sub-section 1 (5) of the Safeguarding of Industries Act no repayment of duty could be made in cases in which duty had either been improperly collected or paid under protest.

Export of Morphine

Replying to Mr. Ramsden (House of Commons, June 28), Mr. Shortt said the export of morphine from this country was prohibited except under licence from the Home Office, and all possible steps were being taken to prevent its export for other than medical or scientific purposes.

Purchase of German Dyes

Mr. Baldwin, in reply to Major Barnes (House of Commons, July 3), said he was informed that apart from small samples of about 1 kilogram each, obtained for research and experimental purposes, no dyestuffs or intermediates of German manufacture were purchased by the British Dyestuffs Corporation during 1921.

Small Consignments

Sir W. Mitchell-Thomson informed Lt.-Commander Kenworthy (House of Commons, June 20) that it would not be possible, without legislation which at present was not contemplated, to take some action to exempt small consignments from duties under the Safeguarding of Industries Act when the amount of duty did not reach 10s.

Reparation Duty

In reply to Mr. Kiley (House of Commons, July 4), Sir R. Horne said that goods of German manufacture imported into this country through France, Belgium or Italy would be exempt from the Reparations levy provided they had been the subject of a genuine sale to an independent purchaser in such country who had subsequently re-sold them to an importer in the United Kingdom.

Glass Bottles

In reply to Dr. Murray (House of Commons, July 3), Mr. Baldwin said the advisability or otherwise of imposing a duty on imported glass bottles and omitting all kinds of bottles which had previously been dealt with by Sir William Ashley's Committee was a matter for the Board of Trade and the House of Commons to consider. Paragraph 5 of the Report of the Glassware Committee presided over by Sir William Ashley explicitly stated that products of the bottle-making industry were not brought within the purview of that Committee.

Dyestuffs (Import Regulation) Act

Mr. Hogge (House of Commons, July 3) asked the President of the Board of Trade how many meetings there had been of the licensing committee appointed under the Dyestuffs (Import Regulation) Act; and what quorum, if any, was necessary for the consideration and the refusal of requests for licences to import.

Mr. Baldwin said the answer to the first part of the question was 40, and to the second part, one independent member, one dye-maker representative, and two dye-user representatives.

Negotiations with German Dye Firms

Captain Bagley (House of Commons, June 28) asked if the Board of Trade had any information which would indicate that critics of the British Dyestuffs Act had been in consultation or negotiation with German dyestuffs interests with a view to devising means of securing the modification or repeal of the Act.

Sir William Mitchell-Thomson said that no doubt persons interested in the importation of German dyestuffs into this country had endeavoured to obtain from German makers price quotations which could be adduced as arguments for the modification of the Act, but he had no reason to think that this had been done to any great extent.

Scientific Instruments

Dr. Murray (House of Commons, July 3) asked the President of the Board of Trade whether his attention had been drawn to the statement in the last Annual Report of the Medical Research Committee of the Privy Council to the effect that its operations had been greatly hampered by the present high cost of scientific instruments and materials; and whether, in view of the fact that other eminent scientific workers had repeatedly stated that the Safeguarding of Industries Act was the chief factor in raising the cost of instruments and chemicals, and in increasing the difficulties of procuring the same, he would advise the Government in favour of repealing or amending the Act in the interests of the health of the people.

Mr. Baldwin said he had seen the statement referred to. The Report containing it related to the year ended September 30, 1921, when the Safeguarding of Industries Act was not in operation, and thus confirmed the view that the increased cost of research was not due mainly, or even very appreciably, to that Act.

Payment of Duty

Major M. Wood (House of Commons, July 3) asked the President of the Board of Trade whether, when a dispute arose between an importer of commodities and His Majesty's Board of Customs as to the levying of a duty under Part I of the Safeguarding of Industries Act, the importer could only obtain delivery by payment of the duty demanded, and that when the duty was so paid the applicant was not entitled to take his case to the Referee, as the Referee would only deal with cases in which the duty had not been paid; and, if so, whether he was prepared to take action to amend the Act so as to remedy this.

Sir J. Baird said the procedure in such a case was regulated by Sections 10 and 11 of the Safeguarding of Industries Act and Sections 30 and 31 of the Customs Consolidation Act, 1876, under which the importer could obtain delivery of the goods on making entry and depositing the duty demanded by the Customs pending an appeal to the Referee. The law assumed the existence of a dispute at the time the duty was demanded. If the liability was not disputed at the time of making entry, but duty was paid in the ordinary way without protest, it was not possible to raise the question subsequently.

British Dyestuffs Corporation

Mr. G. Thorne (House of Commons, June 26) asked the President of the Board of Trade whether he was aware that public anxiety with regard to the present and future of the dye industry in this country had been increased by the disclosures at the recent annual meeting of the British Dyestuffs Corporation; and whether he would now consider the appointment of a Select Committee to go into the whole question.

Sir W. Mitchell-Thomson said Mr. Baldwin had already stated that he was not prepared to recommend the appointment of a Committee, and he saw no reason to modify that conclusion.

Major Barnes (House of Commons, July 3) asked the President of the Board of Trade whether he would consider the advisability, in making any further appointments to the board of the British Dyestuffs Corporation, of making it a condition that no person so appointed should be a director or interested in other dye or chemical companies.

Mr. Baldwin said the board of the British Dyestuffs Corporation was not appointed by the Board of Trade, whose powers were limited to the nomination of the two Government representatives. But, in any event, he did not think that such a restriction as Major Barnes had suggested would necessarily be an advantageous one.

Replying to a further question by Major Barnes, Mr. Baldwin said he did not propose to take steps to provide that at least one of the Government nominees on the board of the Dyestuffs Corporation should have special knowledge of dye-making.

From Week to Week

Mr. J. T. MIDDLETON, Chairman of Walter Scott and Middleton, Ltd., who died last week, was also a member of the board of the Leeds Phosphate Works, Ltd., and the Mountain Copper Co., Ltd.

Mr. ERNEST BARNES, who was connected for many years with Charles Windschuegl and Co., has joined the staff of Allen Craig and Co. (London), Ltd., 43-45, Great Tower Street, London, as a representative.

It is reported that the CZECHO-SLOVAK EXPLOSIVES FACTORY has increased its capital and has acquired a site near Paradubice, where, in co-operation with an English company, a powder factory will be started.

A distinguished caller at THE CHEMICAL AGE offices this week was DR. RICHARD B. MOORE, Chief Chemist of the United States Bureau of Mines, Washington, D.C. According to his present itinerary he will remain in this country until July 13.

THE BRITISH BROKEN HILL PROPRIETARY CO., LTD., state that a cable, received on July 1, indicates that, owing to an accident to the machinery, operations will probably be suspended for about three weeks.

Statistics of the French Dye Manufacturers' and Consumers' Union show that of the 10,000 tons of DYE PRODUCTS used by France in 1920 as many as 5,739 tons were imported. Consumption fell to 7,000 tons last year and the quantity imported was only 1,172 tons.

July 31 is the last day on which applications will be received for the CHAIR OF INORGANIC CHEMISTRY at the University of Cape Town. Particulars are obtainable from the Secretary, Office of the High Commissioner for the Union of South Africa, Trafalgar Square, London, W.C.

Applications are invited for the post of assistant in the DEPARTMENT OF PHYSICS, University College, London, under Professor Sir William Bragg. The commencing salary is £300, and further particulars may be obtained on application to Dr. W. W. Seton, University College, Gower Street, London.

At the Manchester University yesterday (Friday) Sir E. J. RUSSELL, F.R.S., of the Rothamsted Experimental Station, was granted the honorary degree of Doctor of Science. He was formerly a student and lecturer on chemistry in Owens College, where he undertook valuable researches.

The death occurred at Worthing, on Monday, of Mr. Ambrose Clarke, for many years a director of Spicer Brothers, Ltd. He retired from the board in March last year, having been connected with the business since March, 1868. The interment took place at Broadwater Cemetery, Worthing, on Thursday.

According to a New Zealand newspaper a discovery of "FRANKLINITE" has been made in the fiord country in Southland. While the statement has since been confirmed by the New Zealand Department of Mines, it is not known whether the mineral is available in large quantities, and no great importance as a commercial proposition is attached to the discovery.

As compared with April, the value of duty-free German imports into the United Kingdom during May shows an increase of £106,361, nearly all sections having heavier receipts of goods. Heavy IMPORTS OF FINISHED DYESTUFFS derived from coal tar and a slight increase in the amount of alizarine received have caused the value of dyes and dyestuffs to increase by £22,248.

The Council of the Royal Society of Arts attended at Clarence House, St. James's, London, on June 29, when the Duke of Connaught, President of the Society, presented THE ALBERT MEDAL of the Society for the present year to Sir Dugald Clark, K.B.E., D.Sc., F.R.S., "in recognition of his important contributions, both theoretical and practical, to the development of the internal combustion engine."

AT AN INQUEST, held on June 20, relative to the death of Mr. W. E. Scott, a process worker at the dye works of Brotherton and Co., Ltd., Bromborough, Mr. G. E. Smith, works chemist, said he was of the opinion that the explosion which resulted in the death of Mr. Scott was caused by a pebble or a piece of flint being accidentally raked into the mill during the process of mixing dyes. The Coroner found that Mr. Scott met his death accidentally.

Dr. F. G. COTTRELL, at present Chairman of the Division of Chemistry and Chemical Technology, of the United States National Research Council, has been appointed to the directorship of the Fixed Nitrogen Research Laboratory at Washington. The laboratory was established under the War Department, but was transferred to the Department of Agriculture last July. Work is now being carried out with special reference to the use of the Muscle Shoals cyanamid plant.

A general meeting of the members of the ROYAL INSTITUTION was held on Monday, Sir James Crichton-Browne, Treasurer and Vice-President, in the chair. Viscountess D'Arcy, Miss E. Fairfax, Sir Thomas Fisher, Mrs. Grove-Hills, Mr. J. Hetherington, Mr. A. J. Lambert, Mr. W. F. Roch, Captain Riall Sankey, Lieut.-Colonel J. A. Stirling, and Mr. C. Tierney were elected members. The death of the Prince of Monaco, an honorary member of the Institution, was announced and a resolution of condolence was passed.

At a conference of manufacturers in London on Tuesday, under the auspices of the National Union of Manufacturers, and presided over by Mr. G. Terrell, M.P., a resolution was unanimously passed calling upon the Government to formulate a policy under certain specified heads, one of which refers to the speeding up of the procedure under Part II of the SAFEGUARDING OF INDUSTRIES ACT. The Duke of Northumberland, on referring to the working of the Act, declared that the Government must make up its mind whether it was going in for free trade or for protection, because the present ridiculous combination of the two policies was absolutely useless.

According to reports from New York, President Harding has announced that he has directed Colonel Miller, the Alien Property Custodian, to demand from the CHEMICAL FOUNDATION, New York, which is headed by Mr. Francis Garvin, the former custodian, a return to the Government of all German patents taken over by the Foundation, under arrangement with the Government during Mr. Garvin's control as custodian. The Order asserts that it is the President's belief that the Government has not faithfully observed the trust which was implied in the seizure of patents, trade marks, copyrights, contracts, and other properties now in possession of the Chemical Foundation.

Speaking on June 30 at the annual meeting of the United Glass Bottle Manufacturers, Ltd., Mr. GEORGE E. ALEXANDER said that, although the year 1921 was one of the worst that had ever been experienced, the fortunes of the company had gradually improved from the commencement of this year. They had completed the full unit of eight Owens machines at the Charlton factory, and had orders on their books to keep the whole of them employed for some time ahead, and nearly all for a type of bottle which the company did not manufacture before the war. The St. Helen's works were not quite in such a favourable position, but signs of improvement were also being experienced there.

The Glasgow Corporation Chemical Works have started up a number of new plants. Mr. W. A. Walmsley, manager, states that considerable improvements have been effected, and new plants are nearing completion, the object being efficient and economical working. The price obtained for sulphate of ammonia at one time barely covered the cost of manufacture. During the past six months the prices of sulphate and of tar products improved slightly. The financial statement for the year shows a net revenue of £165,619 19s. 6d., after paying rates and taxes and all working expenses. New ferro-concrete tanks have been erected.

At a meeting of the Royal Society on June 22, Sir Charles Sherrington, president, in the chair, papers were read by Dr. E. F. Armstrong and Dr. T. P. Hilditch as further contributions to their studies of the MECHANISM OF CATALYTIC ACTION at solid surfaces. The first paper dealt with the action of sodium carbonate in promoting the hydrogenation of phenol. An account was given of the stimulating action of small amounts of mild alkali, especially anhydrous sodium carbonate, upon the hydrogenation of phenol in the liquid state in presence of nickel. In the second paper the production of catalysts by reduction of mixed copper-nickel carbonates below 200° C. had been studied, and it was emphasised that comparison between catalysts should be made under conditions in which the simple catalyst (nickel alone) is mechanically distributed to give maximum surface area. In this way it was found that copper-nickel catalysts prepared at 180° C. are not so highly active as the plain nickel catalyst reduced at a higher temperature, but nevertheless display considerable activity.

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COMPLEX COMPOUNDS.—The chloro-irideates of complex metal bases. A. Benrath, W. Bücher and H. Eckstein. *Z. anorg. u. allg. Chem.*, May 24, 1922, pp. 347-360.

THALLIUM SALTS.—Thallic thallous sulphate. A. Benrath and H. Espenschied. *Z. anorg. u. allg. Chem.*, May 24, 1922, pp. 361-372.

INSULATORS.—Electric insulating substances, particularly bakelite material. A. Bültemann. *Kunststoffe;* Part I, May (1), 1922, pp. 66-68; Part II., May (2), 1922, pp. 76-78.

ANALYSIS.—The analysis of polythionates. A. Kurtenacker and A. Fritsch. *Z. anorg. u. allg. Chem.*, May 24, 1922, pp. 335–343.

Estimation of arsenic acid. L. Rosenthaler. *Z. anal. Chem.*, No. 6, 1922, pp. 222–229.

A volumetric method for the estimation of hydrosulphurous and sulphoxylic acids. F. de Bacho. *Z. anal. Chem.*, No. 6, 1922, pp. 209–219.

Iodometric estimation of the sulphides of arsenic and antimony. F. Nikolai. *Z. anal. Chem.*, No. 7, 1922, pp. 257–272.

Patent Literature

Abstracts of Complete Specifications

180,353. ARTIFICIAL TANNING SUBSTANCES. M. Melamid, 9, Urachstrasse, Freiburg, Baden, Germany. Application date, November 26, 1920. Addition to 163,679.

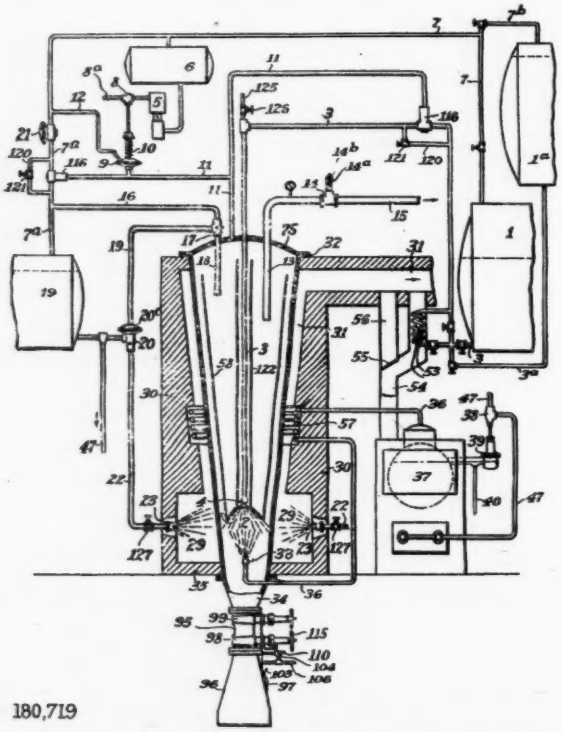
Specification 163,679 describes a process for producing tanning substances in which the condensation product obtained by treating cresol with acetylene in the presence of a mercury compound as a catalyst, is distilled and sulphonated. It is now found that the distillation may be omitted if cresols or higher phenols derived from anthracene oil, or naphthalene, are treated with acetylene and sufficient sulphuric acid to yield the sulphonated product. Alternatively the sulphonated products obtained by treating cresols, the higher phenols derived from anthracene oil, or naphthalene, with sulphuric acid, or the α or β-naphthalene sulphonic acids are treated with acetylene in the presence of a mercury compound such as the oxide.

180,433. MORDANT DYEING DYESTUFFS AND CHROMIUM COMPOUNDS THEREOF. O. Imray, London. From Society of Chemical Industry in Basle, Switzerland. Application date, February 22, 1921.

A diazo compound of 1-amino-2-oxynaphthalene-4-sulphonic acid, or of a derivative, is coupled with halogen substitution products of α-naphthol to produce dyestuffs which dye wool red-violet in an acid bath. The products may be after-chromed, becoming grey-blue, or after-coppered, becoming violet.

180,719. CRACKING HYDROCARBONS, PROCESS AND APPARATUS FOR. C. S. Davis, 804–807, Wilder Building, Rochester, N.Y., U.S.A. Application date, January 26, 1921.

The apparatus is for cracking crude oil under conditions which are accurately controlled to obtain gas, gasoline, benzene, toluene or the like by the vapour-phase cracking

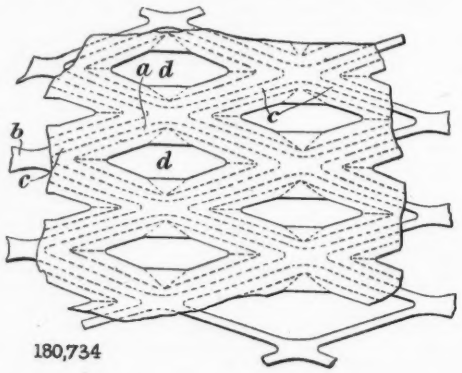


180,719

process. The crude oil is fed from a tank 1, through a pipe 3 to a retort 2, into which it is sprayed by a nozzle 4. A constant pressure is maintained in the tank 1 by an air pump 5, which is connected through a vessel 6 and pipe 7, the steam supply to the pump being controlled by a diaphragm regulator. The gases generated in the retort are discharged through the pipe 13 and valve 14 to a condenser. Fuel oil for heating the retort passes from a tank 19 through a pipe 22 to burners 23, and the supply is controlled by a thermostat 18 which controls the oil delivery valve 20. The flame from the burner is projected into a combustion chamber 29 surrounding the lower part of the retort, and the hot gases pass upwards through a space 31 to the stack. Steam is generated in a boiler 37 and passes through a pipe 36 to a superheater 57 in the combustion space to a nozzle 33 which directs it against the spray of oil. The fuel supply to the boiler through a pipe 47 is automatically regulated to maintain a constant steam pressure. The oil delivered to the retort is preheated as much as possible without producing a deposit, by passing it through a coil 53 located in the boiler flue 54. The steam jet atomises and heats the oil, and also supplies hydrogen by dissociation. Other gases than steam may be generated in the boiler 37, or the oil itself may be distilled in the boiler at a temperature lower than that of cracking. The retort 2 contains a concentric drum 58 which facilitates circulation of the vapour, and is also utilised to remove carbon deposits from the retort walls. For this purpose the drum carries scrapers in contact with the retort wall, and is rotated by gearing during the operation of the retort, so that continuous distillation is possible. The carbon is discharged through gate valves 98, 99 into a receiver 96. An open-ended pipe 122 is provided in the centre of the retort to induce a return of the permanent gases from the upper end of the retort back to the reaction zone. The specification contains also a detailed description of the devices for controlling and regulating the cracking operation.

180,734. GRIDS FOR GAS PURIFIERS, SCRUBBERS AND THE LIKE. H. S. Sadler, Southcott, Nunney Road, Frome, Somerset. Application date, February 23, 1921.

The usual forms of grids for gas purifiers or scrubbers, which are constructed of wooden bars, have been found to deteriorate rapidly, due to exposure to moisture and high temperature, to expansion of the purifying material which they support, and to damage in removing this material. In the present invention these difficulties are overcome by the use of a grid or perforated slab of concrete reinforced with

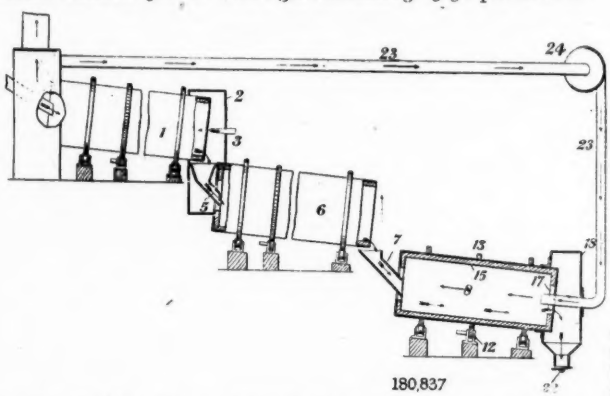


180,734

expanded metal. As shown in the illustration, the concrete is moulded over the expanded metal framework *b*, *c* to form a lattice structure. The gas openings *d* are preferably of smaller dimensions at the top than at the bottom, and the adjacent bars are shaped correspondingly. The side frame of the grid may be integral with the rest of the structure, or may be of wood, and cross bars may also be incorporated to stiffen the grid. In a modification the grid may be formed of bars of concrete with reinforcing metal bars which are looped at their ends around the surrounding bars of the frame. In other forms, the grid may be provided with wood bearing members, or it may be formed of parallel reinforced concrete bars.

180,837. MAGNESITE. METHOD OF TREATING. R. D. Pike, 74, New Montgomery Street, San Francisco, Cal., U.S.A. Application date, April 6, 1921.

When calcined magnesite is used for the manufacture of oxychloride cements, mortars and concretes, water-soluble or free lime must not be present in the magnesite in a proportion exceeding 3 %, to avoid a reduction in the strength of the cement. The object is to utilise crude magnesites in the oxychloride cement industry, which are not used at present owing to their high proportion of calcium carbonate. The magnesite after calcination is subjected to the action of a gas containing carbon dioxide and a trace of water vapour, such as flue gas from a calcining furnace, and it is found that the free lime is converted into carbonate in preference to the magnesia. The carbonate is insoluble in water and does not affect the finished cement. In an example, magnesite containing 4 per cent. of free or water-soluble lime is treated in a closed vessel at 500° C. with a gas containing 25-30 per cent. of



180,837

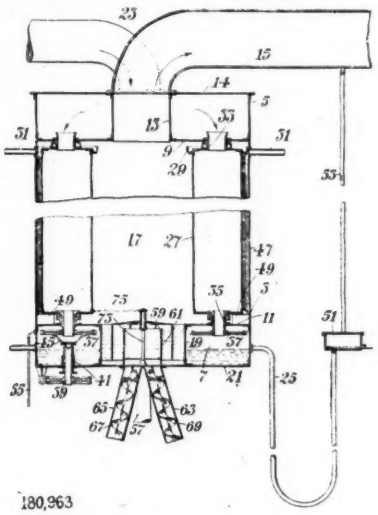
carbon dioxide. The product contains only 1 per cent. of water-soluble lime. The raw material is calcined in an ordinary inclined rotary furnace 1, fitted with a firing hood 2 and burner 3. The best temperature is found to be 800°-950° C., at which the magnesium carbonate is completely calcined and the calcium carbonate partly calcined into oxide. The material then passes through a shoot 5 to an inclined rotary cooler 6, and from this through a shoot 7 to another inclined rotary vessel 8 driven by a gear wheel 12 engaging with a circumferential ring 13. The latter vessel is lined with fire brick 15, and its lower end is surrounded by a hood 18. A pipe 23 extends from the upper end of the kiln 1 to a suction fan 24 and thence to the outlet 17 of the vessel 8, so that flue gases containing carbon dioxide may be delivered from the kiln 1 to the vessel 8. The product is finally delivered through the valve 22. It has been found that a treatment of one hour in the vessel 8 is sufficient and that no external heat is necessary. The process is equally applicable to the treatment of calcined dolomite.

180,890. PULVERISERS AND CRUSHING MILLS. F. G. Brettell, Birmingham. From Soc. Anon. Les Ateliers Réunis, 30, Rue du Point du Jour, Billancourt (Seine), France. Application date, May 25, 1921.

The pulveriser is of the kind in which the crushing is effected by means of tappets or hammers carried on the periphery of a disc rotating within a grinding chamber. The tappets are constructed with their front or forward working faces in the direction of rotation of greater area than their rear faces. The disc carrying the tappets is provided on its face remote from the inlet, with a series of radial blades which complete the pulverisation and create an air current which discharges the pulverised product through a screen surrounding the disc.

180,963. DISTILLING, CONCENTRATING OR DRYING APPARATUS. T. Rigby, 72, Victoria Street, Westminster, London, S.W.1. Application dates, December 24, 1920, and May 26, 1921.

The apparatus is of the kind in which the material to be distilled, concentrated or dried, is spread in a thin film on the surface of a heated drum, and the evolved vapour after compression is used as the heating medium. A casing 3 is divided horizontally by partitions 9, 11 into three compartments 5, 17, 7. A series of hollow vertical drums 27 are mounted on hollow trunnions 33, 35, and each carries a pinion 37. All the pinions are geared together, and are rotated by a shaft 39. The liquid to be treated is passed through a pipe 31 into a trough 29, from which it flows in a thin uniform film on the outer surface of the drums 27. The surfaces of the drums 27



180,963

are kept free from incrustation by means of scrapers 47 fixed to the outer casing, and any detached material is transferred by the scrapers 49 on the drums, into the sump 19. The vapour for heating is supplied through the pipe 23, and passes through the drums 27, while the condensate collects in the space 7. The vapour from the space 17 is withdrawn through the pipe 15 to be compressed and returned through the pipe 23. The concentrate in the sump 19 passes through the pipe 57 to be returned to the system, while a small proportion flows over a weir 59 to discharge pipes 63, 65. A multiple effect apparatus operating on the same principles is also described.

180,968. PREPARATORY TREATMENT OF ORES OR METALLURGICAL PRODUCTS. O. Imray, London. From Jackson and Co., Valparaiso, South America. Application date, April 27, 1921. Addition to 172,356.

Specification 172,356 (see THE CHEMICAL AGE, vol. vi., p. 46) describes a process for treating complex ores with an oxidising agent at a raised temperature, after which the ore is treated by leaching or amalgamation. In the present invention the oxidation treatment is followed by a chloridising roast with a halogen or metal chloride, and then by the leaching or amalgamation. When the ore is treated for the recovery of metals such as silver or gold, the oxidising or sulphatising process with nitre may be reduced to about ten minutes, but if the base metals are also to be recovered, the sulphatising process is completed. The whole process is preferably carried out in a single inclined revolving tubular furnace having the heating grate at the upper end and the ore discharge at the lower end. The rate at which the ore passes through the furnace is regulated by its inclination and rate of rotation. The air supply for oxidation is admitted through passages in the fire-bridge, and a perforated pipe is provided through which hot nitre solution is sprayed on to the ore to oxidise and sulphatise it. When the ore arrives at the chloridising zone at a temperature not exceeding a dull red, it is sprayed with a metal chloride solution, preferably a saturated solution of common salt, and the fire gases are directed on to the ore to increase the temperature except when argentiferous ores are treated. As an alternative to the increase in temperature, the furnace gases containing sulphuric acid vapour are passed into the chloridising zone to react with the sodium chloride and produce hydrochloric acid, which chloridises the metals at a lower temperature. This method is particularly effective for treating sulphur-arsenic-silver and sulphur-antimony-silver combin-

ations. Detailed examples are given of the treatment of a Bolivian complex sulphide ore containing lead, zinc, copper and silver, and also a non-sulphide argentiferous Chilian ore containing cerargyrite, embolite, iodyrite, and small proportions of copper carbonate and oxychloride in a limestone gangue.

NOTE.—Abstracts of the following specifications which are now accepted appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention :—160,172 (L'Air Liquide, Soc. Anon. pour l'Etude et l'Exploitation des Procédés G. Claude) relating to production of bicarbonate of soda and ammonium chloride, see Vol. IV., p. 592 ; 160,466 (Chemical Fuel Co. of America) relating to catalytic processes involving gaseous carbon compounds, see Vol. IV., p. 593 ; 162,657 (E. Krause and H. Blucher), relating to plastic material from casein, see Vol. V., p. 19 ; 164,357 (L. Darrasse, E. Darrasse, and L. Dupont), relating to synthetic camphor, see Vol. V., p. 166 ; 170,848 (Norske Aktieselskab for Elektrokemisk Industri-Hypotekbank), relating to electric furnaces, see Vol. V., p. 802.

179,150. SULPHITE CELLULOSE. Zellstofffabrik Waldhof, Waldhof, Mannheim, Germany. International Convention date, April 27, 1921.

To recover the waste heat and sulphur dioxide from a system of cellulose boilers, the valves leading from the boilers to a tank are opened to reduce the pressure to about 2 atmospheres. The valves are then closed, and cold, fresh lye is allowed to run into the connecting pipes where it absorbs the residual steam and sulphur dioxide from the boilers, and the lye then runs into the tank, where it is saturated with sulphur dioxide.

179,151. FERTILISERS. Zellstofffabrik Waldhof, Waldhof, Mannheim, Germany. International Convention date, April 27, 1921.

Waste sulphite cellulose lye is mixed with quicklime or a mixture of quicklime and magnesia to absorb the water in the lye. The lye is preferably hot and concentrated, and may be mixed with peat dust, phosphates, potassium salts or other fertilisers either before or after grinding.

179,155. SYNTHETIC AMMONIA. Nitrogen Corporation, 55, Canal Street, Providence, R.I., U.S.A. (Assignees of J. C. Clancy, Providence, R.I., U.S.A.) International Convention date, April 30, 1921.

The process is for preparing a catalyst for the synthesis of ammonia at 400°-550° C., and a pressure of 15-100 atmospheres. An alkali or alkaline earth salt of an organic acid, such as a formate, acetate, oxalate, tartrate or phenolate, is heated in dry ammonia at 350°-1000° C. Suitable salts are calcium and potassium oxalates and tartrates, and barium carbonate. Other salts such as manganese carbonate uranium acetate, cobalt acetate, and iron oxalate may also be added. In an example, granulated potassium titanium oxalate is heated in ammonia gas to 500° C. under a pressure of 1-100 atmospheres.

179,194. EMULSIONS, SEPARATING CONSTITUENTS OF. Metcalfe-Shaw Corp., 50, Church Street, New York. (Assignees of E. Metcalfe-Shaw, 1304, Flatbush Avenue, Brooklyn, New York.) International Convention date, May 2, 1921.

The process is particularly suitable for separating aqueous emulsions of water-gas tar and coal-gas tar, and petroleum emulsions known as "brown sediments." A horizontal cylinder is divided into annular compartments which are lined with porous material such as cotton waste. The emulsion is fed into one end of the cylinder, and is absorbed in the porous material. The cylinder is rotated so that rolling weights within it compress the porous material and express the emulsion in heterogeneous form. Alternatively, the emulsion may be passed through a centrifugal separator containing cotton, the speed being varied so that the liquid is first absorbed and then expelled. In another alternative, an endless belt of porous cotton is passed through a bath of the emulsion, which is subsequently expressed by passing the belt between rollers.

179,523. ALDOL. Elektrizitätswerk Lonza, Gampel, Switzerland. International Convention date, May 4, 1921.

Acetaldehyde is cooled and an aqueous solution of barium hydroxide added. The barium is then precipitated as carbonate by means of carbon dioxide, and aldol is obtained.

179,532. IRON AND STEEL MANUFACTURE. G. Constant and A. Bruzac, 1, Rue Droust, Paris. International Convention date, May 9, 1921.

To prevent the formation of slag during the manufacture of iron and steel, the ore is crushed and washed to remove all or part of the gangue. The ore is then dried and reduced by reducing gas in a closed vessel. The metal is transferred to a melting furnace out of contact with air, with or without lime.

LATEST NOTIFICATIONS.

182,084. Manufacture of 2-oxy-1-aryl-naphthylamines. Soc. Anon des Matières Colorantes et Produits Chimiques de Saint-Denis, Wähl, A., and Lantz, R. June 18, 1921.

182,112. Manufacture of esters and ethers of ethylideneglycol and vinyl-alcohol. Consortium Für Elektrochemische Industrie Ges. June 23, 1921.

182,134. Process for the economic employment of the residues resulting from the decomposition of calcium cyanamide by acid. Soc. d'Etudes Chimiques Pour l'Industrie. June 25, 1921.

Specifications Accepted, with Date of Application

158,513. Raw peat and the like, Process for dry distillation and cooking of. A. J. H. Haddan. (*Torfverwertungs-Ges., Dr. Pohl and Von Dewitz.*) January 24, 1921.

160,143. Molybdenum metal or iron molybdenum alloys, Process for the manufacture of. Ampere Ges., F. Rothe and O. Diefenthaler. March 12, 1920.

166,887. Artificial nitrogenous fertilisers, Manufacture of. K. Niedenzu. July 23, 1920.

181,413. Agglomerating pulverous material, Process for. C. T. Thorssell and O. Troell. February 2, 1921.

181,452. Gas or oil-heated furnaces of the crucible type. Stockport furnaces, Ltd., E. Duckworth and A. Mead. March 9, 1921.

181,482. Evaporation plants heated with compressed vapours, Method of operating. Metallbank und Metallurgische Ges. Akt.-Ges, and W. Gensecke. March 14, 1921.

181,486. Catalytic oxidation of ammonia with oxygen, Method for. I. W. Cederberg and H. M. Backstrom. March 15, 1921.

181,502. Kilns. W. G. de Steigner. March 16, 1921.

181,509. Removing free acids from glycerides, Process for. W. Gleitz. March 23, 1921.

181,560. Separation or grading of powdered materials and the treatment thereof by air or other gases or vapours and apparatus to be employed therein. W. H. Reynolds, W. W. Dickin and G. L. T. Kenyon. April 26, 1921.

181,571. Acetylene gas, Materials for purifying. J. R. Booer and District Chemical Co., Ltd. May 9, 1921.

181,575. Artificial resin products, Manufacture of. H. Dreyfus May 12, 1921.

181,584. Pigment colours, Manufacture and production of. J. Y. Johnson. (*Badische Anilin and Soda Fabrik.*) May 20, 1921.

Applications for Patents

Bloxam, A. G., and Chemische Fabrik Griesheim-Elektron. Manufacture of aryl esters of phosphoric acid. 17720. June 27.

Durand et Huguenin Soc. Anon. Manufacture of mordant-dyeing colouring-matters. 17699. June 27. (France, July 15, 1921.)

J. Y. Johnson and Elektrizitätswerk Lonza. Manufacture of metaldehyde. 17806. June 28.

Imray, O. Y., and Society of Chemical Industry in Basle. Manufacture of aryloxynaphthylketones. 18074. June 30.

Nitrogen Corporation. Cellulose solutions. 18149. July 1. (United States, July 2, 1921.)

Nitrogen Corporation. Cellulose solutions. 18150. July 1. (United States, November 21, 1921.)

Nitrogen Corporation. Method of making cellulose compounds. 18151. July 1. (United States, December 23, 1921.)

Seyfferth, E., and Rheinisch-Westfalische Sprengstoff Akt.-Ges. Abteilung Nürnberg vorm. H. Utendoerffer. Process for manufacture of radio-active plastic compositions from cellon, celluloid, etc. 17823. June 28.

Soc. d'Etudes Chimiques pour l'Industrie. Process for employing residues from decomposition of calcium cyanamide by acid. 17544. June 26. (Switzerland, June 25, 1921.)

Spirlet, X. de. Process for concentrating iron ores. 17849. June 28.

Hodgkinson, W. R. Process of purifying oils, etc. 17585. June 26

Westermann, J. T. Process for manufacturing pure sodium chloride. 17760. June 28.

Market Report and Current Prices

Our Market Report and Current Prices are exclusive to* THE CHEMICAL AGE, *and, being independently prepared with absolute impartiality by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., may be accepted as authoritative. The prices given apply to fair quantities delivered ex wharf or works, except where otherwise stated. The current prices are given mainly as a guide to works managers, chemists, and chemical engineers; those interested in close variations in prices should study the market report.

LONDON, JULY 6, 1922.

THE improved outlook recently observed seems to have further broadened, and there has been quite a satisfactory amount of business placed this week, although, of course, it might be possible that some of this business may be due to the turn of the half year.

Prices are in the main very steady, and the competition is strong.

Export trade is only fair.

General Chemicals

ACETONE is scarce on the spot and price continues firm.

ACID ACETIC.—A considerable volume of business has been transacted and the price is steady.

ACID CITRIC is a shade easier, but the material is still scarce on the spot.

ACID FORMIC.—The market would appear to be a shade easier, but the volume of business is satisfactory.

ACID LACTIC is neglected.

ACID OXALIC is in fair demand, and the price is without change.

ACID TARTARIC has again advanced and near delivery is difficult to obtain.

BARIUM CHLORIDE continues extremely firm, with little prompt material available.

CREAM OF TARTAR has again advanced, and makers are well sold ahead.

IRON SULPHATE has been more active.

LEAD ACETATE is in good demand, without change in value.

LEAD NITRATE is steady.

LITHOPONE has met with some inquiry and is firmer in value.

POTASSIUM CARBONATE has been in better request, but the price is still inclined to be weak.

POTASSIUM CAUSTIC is featureless.

POTASSIUM PRUSSIATE has registered a very sharp advance, and spot material is now practically unobtainable.

SODIUM ACETATE is fairly steady, with a moderate demand.

SODIUM BICHROMATE has been asked for, and the price is firmer.

SODIUM NITRITE continues in moderate request, without change in value.

SODIUM PHOSPHATE is unchanged.

SODIUM PRUSSIATE maintains its last advance, and little material is available.

WHITE LEAD is without change.

ZINC OXIDE is in very good request, and the price is firm.

Coal Tar Intermediates

Business continues on quiet lines, but export interest is sustained.

ALPHA NAPHTHOL continues firm, but there is no great inquiry.

ALPHA NAPHTHYLAMINE is without change and is passing regularly into consumption.

ANILINE OIL AND SALT are steady, with rather more demand on export account for both products.

BENZIDINE BASE has been inquired for on export account.

BETA NAPHTHOL is without special change in value.

BETA NAPHTHYLAMINE.—A few home inquiries.

DIMETHYLANILINE has been in demand for home trade.

DINITROCHLORBENZOL is firm.

DIPHENYLAMINE is steady and in demand both on home and export account.

"H" ACID is the turn weaker.

NAPHTHIONIC ACID is steady at last price.

NITROBENZOL is unchanged.

PARANITRANILINE has been inquired for, and the price is firm.

PARAPHENYLENEDIAMINE.—A fair business on home account.

RESORCIN.—Some small inquiry.

Coal Tar Products

The market for most products continues to be active, and a fair amount of business is being done.

90's BENZOL is in rather more request, but without change in value. It remains at 1s. 11d. to 2s. per gallon on rails at works.

PURE BENZOL is quiet at 2s. 4d. per gallon.

CREOSOTE is in good demand at 5d. per gallon in the Midlands and North, at 5¾d. to 6d. per gallon in London.

CRESYLIC ACID remains steady with a moderate demand at 2s. 2d. to 2s. 4d. per gallon for the Pale 97/99% quality, and 1s. 11d. to 2s. per gallon for the Dark 95/97%.

SOLVENT NAPHTHA continues to be neglected, and is quoted at 1s. 8d. to 1s. 9d. per gallon at works.

HEAVY NAPHTHA is in fair demand at 1s. 9d. to 1s. 10d. per gallon.

NAPHTHALENE remains quiet, the crude quality being quoted at £4 10s. per ton to £5 10s. per ton, while flake and crystals are quoted at £18 to £19 per ton.

PITCH.—The demand for prompt parcels continues and full prices are being paid. To-day's quotations are 75s. per ton f.o.b. London, 72s. 6d. f.o.b. East Coast, and 65s. to 67s. 6d. has been paid for delivery of pitch on rails for the home market. Business is restricted owing to the small stocks, and the reluctance of manufacturers to handle pitch at this season.

Sulphate of Ammonia

There is no change in the home price, and the orders for export are restricted owing to uncertainty of the prices in other producing countries.

Current Prices

Chemicals

	Per	£	s.	d.		£	s.	d.
Acetic anhydride	lb.	0	1	8	to	0	1	10
Acetone oil	ton	77	10	0	to	80	0	0
Acetone, pure	ton	73	0	0	to	74	0	0
Acid, Acetic, glacial, 99–100%	ton	67	0	0	to	68	0	0
Acetic, 80% pure	ton	42	0	0	to	43	0	0
Arsenic, liquid, 2000 s.g.	ton	67	0	0	to	70	0	0
Boric, cryst.	ton	60	0	0	to	65	0	0
Carbolic, cryst. 39–40%	lb.	0	0	6	to	0	0	6½
Citric	lb.	0	2	4	to	0	2	5
Formic, 80%	ton	65	0	0	to	66	0	0
Gallic, pure	lb.	0	2	11	to	0	3	0
Hydrofluoric	lb.	0	0	7½	to	0	0	8½
Lactic, 50 vol.	ton	40	0	0	to	43	0	0
Lactic, 60 vol.	ton	43	0	0	to	45	0	0
Nitric, 80 Tw.	ton	30	0	0	to	31	0	0
Oxalic	lb.	0	0	8¼	to	0	0	8½
Phosphoric, 1.5	ton	38	0	0	to	40	0	0
Pyrogallic, cryst.	lb.	0	6	0	to	0	6	3
Salicylic, Technical	lb.	0	0	10½	to	0	1	0
Salicylic, B.P.	lb.	0	1	5	to	0	1	6
Sulphuric, 92–93%	ton	7	10	0	to	8	0	0
Tannic, commercial	lb.	0	2	3	to	0	2	9
Tartaric	lb.	0	1	6	to	0	1	6½
Alum, lump	ton	13	0	0	to	14	0	0
Alum, chrome	ton	28	0	0	to	29	0	0
Alumino ferric	ton	9	0	0	to	9	5	0
Aluminium, sulphate, 14–15%	ton	10	10	0	to	11	0	0
Aluminium, sulphate, 17–18%	ton	11	10	0	to	12	0	0
Ammonia, anhydrous	lb.	0	1	8	to	0	1	9
Ammonia, .880	ton	33	0	0	to	35	0	0
Ammonia, .920	ton	21	0	0	to	23	0	0
Ammonia, carbonate	lb.	0	0	4	to	0	0	4¼
Ammonia, chloride	ton	60	0	0	to	65	0	0
Ammonia, muriate (galvanisers)	ton	35	0	0	to	37	10	0
Ammonia, nitrate (pure)	ton	35	0	0	to	40	0	0
Ammonia, phosphate	ton	74	0	0	to	75	0	0
Ammonia, sulphocyanide	lb.	0	1	10	to	0	2	0
Amyl acetate	ton	175	0	0	to	185	0	0

	Per	£	s.	d.		£	s.	d.
Arsenic, white, powdered	ton	42	0	0	to	44	0	0
Barium, carbonate, 92–94%	ton	12	10	0	to	13	0	0
Barium, Chlorate	ton	60	0	0	to	68	0	0
Barium Chloride	ton	19	10	0	to	20	0	0
Nitrate	ton	27	10	0	to	30	0	0
Sulphate, blanc fixe, dry	ton	20	10	0	to	21	0	0
Sulphate, blanc fixe, pulp	ton	10	5	0	to	10	10	0
Sulphocyanide, 95%	lb.	0	1	0	to	0	1	3
Bleaching powder, 35–37%	ton	12	0	0	to	—		
Borax crystals	ton	29	0	0	to	33	0	0
Calcium acetate, Brown	ton	9	0	0	to	9	10	0
" " Grey	ton	13	10	0	to	14	0	0
Calcium Carbide	ton	16	0	0	to	17	0	0
Chloride	ton	6	10	0	to	7	0	0
Carbon bisulphide	ton	50	0	0	to	52	0	0
Casein, technical	ton	47	0	0	to	55	0	0
Cerium oxalate	lb.	0	4	6	to	0	4	9
Chromium acetate	lb.	0	1	1	to	0	1	3
Cobalt acetate	lb.	0	6	0	to	0	6	6
Oxide, black	lb.	0	9	6	to	0	10	0
Copper chloride	lb.	0	1	2	to	0	1	3
Sulphate	ton	28	10	0	to	29	0	0
Cream Tartar, 98–100%	ton	115	0	0	to	117	10	0
Epsom salts (*see* Magnesium sulphate)								
Formaldehyde, 40% vol.	ton	68	10	0	to	70	0	0
Formusol (Rongalite)	lb.	0	2	6	to	0	2	9
Glauber salts, commercial	ton	5	10	0	to	6	0	0
Glycerine, crude	ton	65	0	0	to	67	10	0
Hydrogen peroxide, 12 vols.	gal.	0	2	5	to	0	2	6
Iron perchloride	ton	30	0	0	to	32	0	0
Iron sulphate (Copperas)	ton	4	0	0	to	4	5	0
Lead acetate, white	ton	42	0	0	to	43	0	0
Carbonate (White Lead)	ton	42	0	0	to	46	0	0
Nitrate	ton	46	10	0	to	48	10	0
Litharge	ton	35	10	0	to	36	0	0
Lithopone, 30%	ton	25	10	0	to	26	0	0
Magnesium chloride	ton	10	0	0	to	10	10	0
Carbonate, light	cwt.	2	10	0	to	2	15	0
Sulphate (Epsom salts commercial)	ton	8	0	0	to	8	10	0
Sulphate (Druggists')	ton	13	10	0	to	14	10	0
Manganese, Borate, commercial	ton	65	0	0	to	75	0	0
Sulphate	ton	60	0	0	to	62	0	0
Methyl acetone	ton	60	0	0	to	65	0	0
Alcohol, 1% acetone	ton	65	10	0	to	66	0	0
Nickel sulphate, single salt	ton	49	0	0	to	51	0	0
Ammonium sulphate, double salt	ton	51	0	0	to	52	0	0
Potash, Caustic	ton	33	0	0	to	34	0	0
Potassium bichromate	lb.	0	0	6¾	to	—		
Carbonate, 90%	ton	31	0	0	to	33	0	0
Chloride, 80%	ton	12	0	0	to	12	10	0
Chlorate	lb.	0	0	4½	to	0	0	5
Meta bisulphite, 50–52%	ton	84	0	0	to	90	0	0
Nitrate, refined	ton	45	0	0	to	47	0	0
Permanganate	lb.	0	0	9	to	0	0	10
Prussiate, red	lb.	0	4	6	to	0	4	9
Prussiate, yellow	lb.	0	1	6	to	0	1	8
Sulphate, 90%	ton	13	0	0	to	13	10	0
Salammoniac, firsts	cwt.	3	3	0	to	—		
Seconds	cwt.	3	0	0	to	—		
Sodium acetate	ton	24	10	0	to	24	15	0
Arseniate, 45%	ton	45	0	0	to	48	0	0
Bicarbonate	ton	10	10	0	to	11	0	0
Bichromate	lb.	0	0	5½	to	—		
Bisulphite, 60–62%	ton	23	0	0	to	24	0	0
Chlorate	lb.	0	0	3¾	to	0	0	4
Caustic, 70%	ton	20	10	0	to	21	0	0
Caustic, 76%	ton	21	10	0	to	22	10	0
Hydrosulphite, powder, 85%	lb.	0	1	9	to	0	2	0
Hyposulphite, commercial	ton	13	10	0	to	14	0	0
Sodium Nitrite, 96–98%	ton	31	0	0	to	32	0	0
Phosphate, crystal	ton	18	10	0	to	19	0	0
Perborate	lb.	0	0	11	to	0	1	0
Prussiate	lb.	0	0	11½	to	0	1	0
Sulphide, crystals	ton	13	0	0	to	14	0	0
Sulphide, solid, 60–62%	ton	21	10	0	to	23	10	0
Sulphite, cryst.	ton	12	10	0	to	13	0	0
Strontium carbonate	ton	55	0	0	to	60	0	0
Strontium Nitrate	ton	50	0	0	to	55	0	0
Strontium Sulphate, white	ton	6	10	0	to	7	10	0
Sulphur chloride	ton	25	0	0	to	27	10	0
Sulphur, Flowers	ton	13	0	0	to	14	0	0
Roll	ton	13	0	0	to	14	0	0
Tartar emetic	lb.	0	1	6	to	0	1	7
Tin perchloride, 33%	lb.	0	1	2	to	0	1	4
Perchloride, solid	lb.	0	1	5	to	0	1	7
Protochloride (tin crystals)	lb.	0	1	5	to	0	1	6

	Per	£	s.	d.		£	s.	d.
Zinc chloride 102° Tw.	ton	21	0	0	to	22	10	0
Chloride, solid, 96–98%	ton	25	0	0	to	30	0	0
Oxide, 99%	ton	36	0	0	to	38	0	0
Dust, 90%	ton	45	0	0	to	47	10	0
Sulphate	ton	18	10	0	to	19	10	0

Coal Tar Intermediates, &c.

	Per	£	s.	d.		£	s.	d.
Alphanaphthol, crude	lb.	0	2	3	to	0	2	6
Alphanaphthol, refined	lb.	0	3	0	to	0	3	3
Alphanaphthylamine	lb.	0	2	0	to	0	2	1
Aniline oil, drums extra	lb.	0	1	0	to	0	1	1
Aniline salts	lb.	0	1	1	to	0	1	2
Anthracene, 40–50%	unit	0	0	8½	to	0	0	9
Benzaldehyde (free of chlorine)	lb.	0	3	9	to	0	4	3
Benzidine, base	lb.	0	5	9	to	0	6	0
Benzidine, sulphate	lb.	0	5	9	to	0	6	0
Benzoic acid	lb.	0	1	7½	to	0	1	9
Benzoate of soda	lb.	0	1	6	to	0	1	7
Benzyl chloride, technical	lb.	0	2	0	to	0	2	3
Betanaphthol benzoate	lb.	0	4	9	to	0	5	0
Betanaphthol	lb.	0	1	4	to	0	1	4½
Betanaphthylamine, technical	lb.	0	6	0	to	0	7	0
Croceine Acid, 100% basis	lb.	0	3	6	to	0	3	9
Dichlorbenzol	lb.	0	0	9	to	0	0	10
Diethylaniline	lb.	0	2	9	to	0	3	0
Dinitrobenzol	lb.	0	1	3	to	0	1	4
Dinitrochlorbenzol	lb.	0	0	11	to	0	1	0
Dinitronaphthalene	lb.	0	1	4	to	0	1	5
Dinitrotoluol	lb.	0	1	5	to	0	1	6
Dinitrophenol	lb.	0	2	9	to	0	3	0
Dimethylaniline	lb.	0	2	3	to	0	2	6
Diphenylamine	lb.	0	4	3	to	0	4	6
H-Acid	lb.	0	6	6	to	0	7	0
Metaphenylenediamine	lb.	0	5	6	to	0	5	9
Monochlorbenzol	lb.	0	0	10	to	0	1	0
Metanilic Acid	lb.	0	6	0	to	0	6	6½
Monosulphonic Acid (2.7)	lb.	0	5	6	to	0	6	0
Naphthionic acid, crude	lb.	0	3	0	to	0	3	3
Naphthionate of Soda	lb.	0	3	0	to	0	3	3
Naphthylamin-di-sulphonic-acid	lb.	0	4	0	to	0	4	3
Neville Winther Acid	lb.	0	7	9	to	0	8	0
Nitronaphthalene	lb.	0	1	4	to	0	1	5
Nitrotoluol	lb.	0	1	0	to	0	1	2
Orthoamidophenol, base	lb.	0	10	0	to	0	10	5
Orthodichlorbenzol	lb.	0	1	0	to	0	1	1
Orthotoluidine	lb.	0	1	6	to	0	1	9
Orthonitrotoluol	lb.	0	0	10	to	0	1	0
Para-amidophenol, base	lb.	0	10	0	to	0	10	6
Para-amidophenol, hydrochlor	lb.	0	10	6	to	0	11	0
Paradichlorbenzol	lb.	0	0	6	to	0	0	7
Paranitraniline	lb.	0	3	6	to	0	3	9
Paranitrophenol	lb.	0	2	3	to	0	2	6
Paranitrotoluol	lb.	0	5	0	to	0	5	3
Paraphenylenediamine, distilled	lb.	0	10	6	to	0	10	9
Paratoluidine	lb.	0	7	0	to	0	7	6
Phthalic anhydride	lb.	0	2	9	to	0	3	0
Resorcin, technical	lb.	0	5	6	to	0	6	0
Resorcin, pure	lb.	0	7	0	to	0	7	3
Salol	lb.	0	2	1	to	0	2	4
Sulphanilic acid, crude	lb.	0	1	0	to	0	1	1
Tolidine, base	lb.	0	6	6	to	0	7	0
Tolidine, mixture	lb.	0	2	6	to	0	2	9

French Potash

THE Alsace-Lorraine Trading Co. report:—Apart from certain activities in the export trade the amount of actual buying of potash fertilisers is not very extensive at this season. In common with most other fertilisers potash is required more particularly during the autumn and early spring months, although the limited demand for chemical purposes always creates an interest in high grade sylvinites. During the present season a special grade of French kainit for the destruction of weeds in corn crops has been in demand in certain localities. Supplies of French potash in England have been well absorbed, and negotiations are now proceeding for large orders to be delivered in the autumn. Definite prices for autumn supplies have not been announced, but it is understood that they are to be very favourable to fertiliser manufacturers and other large importers. The low prices at which the different potash salts have been quoted during the past season leave little room for any considerable reductions. Owing to the higher railway rates consumers are no doubt paying more than the pre-war prices for their potash supplies, but the fact remains that import prices are now a considerable way below the pre-war figure.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinions.*

GLASGOW, JULY 4, 1922.

THE number of orders received continues to be small, but inquiries are numerous, although quantities are insignificant.

There is nothing of importance to record, prices being fairly steady.

Industrial Chem'cals

ACETONE.—B.G.S., £68 per ton. Owing to increased consumption in the United States, higher prices are looked for.

ACID ACETIC.—Good inquiry, and supplies for prompt delivery inclined to be scarce. Glacial 98/100%, about £64 to £65 per ton; 80% B.P., £44 per ton; 80% tech., £41 per ton.

ACID BORACIC.—Crystal or granulated, £60 per ton; powdered, £62 per ton.

ACID CARBOLIC.—Quoted 6d. per lb., f.o.b. U.K.

ACID HYDROCHLORIC.—No change in price, 6s. 6d. per carboy, ex works.

ACID NITRIC, 80°.—Very little inquiry, £25 to £26 per ton.

ACID OXALIC.—Quoted 8¼d. to 8½d. per lb. In little demand.

ACID SULPHURIC.—Prices unchanged, 144°, £4 per ton; 168°, £7 5s. per ton; de-arsenicated quality, £1 per ton more.

ALUMINA SULPHATE.—Moderate inquiry. Continental offers of £8 15s. per ton for 14/15%; £11 per ton for 17/18%.

ALUMINA CHROME.—A few inquiries for export. Quoted £23 per ton f.o.b. U.K.

ALUM, LUMP POTASH.—Continental make quoted £15 to £15 5s. per ton, ex store.

AMMONIA CARBONATE.—Lump, 4d. per lb.; powder, 4¼d. per lb., delivered.

AMMONIA CHLORIDE.—Muriate: moderate inquiry, price £34 per ton. Salammoniac Crystals: quoted £57 per ton; in little demand.

AMMONIA SULPHATE.—25¼%, £15 10s. per ton; 25¾% neutral, £16 13s. per ton, ex works, prompt delivery.

ARSENIC, WHITE POWDERED.—Moderate inquiry. Price £44 per ton, ex quay.

BARIUM CHLORIDE.—Quoted £20 to £21 per ton.

BARYTES.—Finest white, £5 5s. per ton, ex works. Cheap offers of Continental make, but delivery uncertain.

BLEACHING POWDER.—New prices now in force. Spot lots £13 per ton, ex station.

BORAX.—Crystal or granulated, £29 per ton; powdered, £30 per ton.

CALCIUM CHLORIDE.—English make, £6 10s. per ton, ex station.

COPPER SULPHATE.—Moderate inquiry, £28 to £29 per ton, ex store.

COPPERAS, GREEN.—£3 15s. to £4 per ton, ex works, in full loads.

FORMALDEHYDE, 40%.—Offered for forward delivery at £59 per ton c.i.f. U.K. ports.

GLAUBER SALTS.—Little inquiry, £5 per ton, ex store.

LEAD, RED.—£37 10s. per ton. A few inquiries.

LEAD, WHITE.—£50 10s. per ton. In little request.

MAGNESITE, GROUND CALCINED.—Practically no demand. £10 to 12 10s. per ton, according to quality.

MAGNESIUM CHLORIDE.—Spot lots, £7 10s. per ton, ex store. Continental offers of £6 per ton c.i.f. U.K.

MAGNESIUM SULPHATE (Epsom salts).—Commercial, £7 10s. per ton; B.P. quality, £9 15s. per ton.

POTASSIUM BICARBONATE.—Offered at £36 per ton f.o.b. U.K. port.

POTASSIUM BICHROMATE.—Price unchanged, 6¾d. per lb. delivered.

POTASSIUM CARBONATE, 90/92%.—In little demand. Price about £29 to £30 per ton.

POTASSIUM CAUSTIC, 88/92%.—Fair inquiry. £33 to £34 per ton.

POTASSIUM NITRATE (SALTPETRE).—A few local inquiries. £34 to £35 per ton, ex store.

POTASSIUM PERMANGANATE.—Quoted, 10¼d. per lb. ex station.

SODIUM ACETATE.—Practically no demand. Quoted about £24 to £25 per ton.

SODIUM BICARBONATE.—Refined quality, £11 per ton ex quay or station; mineral water quality, £10 per ton.

SODIUM BICHROMATE.—Price unchanged, 5¼d. per lb. delivered.

SODIUM CARBONATE (SODA CRYSTALS).—£6 per ton ex quay or station.

SODIUM CARBONATE (ALKALI).—58%, £9 2s. 6d. per ton ex quay or station.

SODIUM CAUSTIC.—Reduction of £2 per ton now in force. 76/77%, £23 10s.; 70/72%, £21 10s.; 60%, £24 5s.; 98/99%, powdered, £27 to £28 per ton ex station.

SODIUM HYPOSULPHITE.—Commercial crystals offered at £13 10s. per ton f.o.b. for export. Spot lots of pea crystals ex stock at £20 10s. per ton.

SODIUM NITRATE.—Quoted £14 per ton f.o.r. or f.o.b. Refined quality, 5s. per ton more.

SODIUM SULPHATE (SALTCAKE 95%).—Price unchanged, £4 per ton delivered. A few inquiries for export.

SODIUM SULPHIDE, 60/62%.—Solid, £21 per ton; broken, £23 per ton ex station.

SULPHUR.—Surplus Government stocks of Sicilian thirds available at £4 5s. to £4 15s. per ton, according to quantity; roll, £14 per ton; rock, £13 per ton; ground, £13 per ton; flowers, £15 per ton. Moderate inquiry for roll.

ZINC CHLORIDE, 98/99%.—Offered for forward delivery at £21 per ton c.i.f. U.K.

Coal Tar Intermediates and Wood Distillation Products

AMIDO NAPHTHOL SULPHONIC ACID, 1, 2, 4.—Inquiries for the home trade. Price quoted 4s. 6d. per lb., 100% basis, carriage paid.

BENZOL.—The market still remains weak, and prices are inclined to fall.

CHROMOTROPE ACID.—Home inquiries. Price quoted 13s. per lb. on 100% basis, delivered.

DIMETHYLANILINE.—Inquiries for the home trade. Price quoted, 2s. 6d. per lb. delivered, returnable drums.

GAMMA ACID.—Some demand for the home market. Price quoted, 14s. per lb., 100% basis, carriage paid.

"H" ACID.—Business is being done in large quantities at 6s. 6d. per lb. For smaller lots prices up to 6s. 9d. are asked.

PARAPHENYLENEDIAMINE BASE.—Home inquiries. Price, 15s. per lb. delivered.

PHENYL PERI ACID.—Home inquiry. Price quoted, 6s. per lb. on 100% basis.

PHTHALIC ANHYDRIDE.—Inquiry for the home market. Price, 2s. 6d. per lb. delivered.

The Lyons Chemical Conference

AT the meeting of the International Union of Pure and Applied Chemistry on July 1, Sir William Pope was elected President for the period of three years. The new Vice-Presidents are Professor E. Billmann (Denmark), Professor Bancroft (United States of America) Senator Paterno (Italy), and Professor Votocek (Czecho-Slovakia). The next meeting of the Union will be held at Cambridge in 1923. Dr. Charles Parsons made an unofficial invitation to the Union to visit the United States for the 1926 Meeting.

Contracts Open

Tenders are invited for the following articles. The latest dates for receiving tenders are, when available, given in parentheses:

WARRINGTON (July 11).—Disinfectants. Particulars from Cleansing Superintendent, Howley. Tenders to Chairman, Sanitary Works Committee, Town Hall, Warrington.

German Chemical Trade Notes

FROM OUR OWN CORRESPONDENT.

Berlin, July 4th, 1922.

THE dullness which characterised the German chemical market during the last few weeks has given way to a revival of activity and trading both on the domestic and the export market. The main feature at the time of writing is the continued rise in prices.

Consumers and speculators are inclining again towards heavier buying, but the difference between holders' quotations and purchasers' ideas about prices vary noticeably. The present shortage of coal is making itself felt in the chemical industry. Heavy price increases are expected in the near future.

Commenting on the accounts of the British Dyestuffs Corporation, the *Deutsche Allgemeine Zeitung* states that "the announcement clearly reveals the true condition of the British dye industry, and confirms our so often and so strongly expressed opinion that this industry, as organised during the war, cannot, in the long run, exist, and therefore it will never be in a position to compete successfully against the German dye works."

A revival in the Upper Silesian zinc industry is at present impossible, a decline having set in, which, it appears likely, will continue for some time.

The following quotations are given in marks per kilogram (d.=domestic price, e.=export price).

ACIDS: Acetic, 80%, offered in small parcels, which were taken up at 60 mk. d.; 100%, 70 mk. d. Benzoic, 185 mk. d.; 200 mk. e. Boric, 90 mk. d. Citric, in good demand at 330 mk. d.; 320 mk. e. Muriatic, freely offered; business passing within moderate limits at previous prices. Oxalic, 98/100%, 39 mk. d.; 65 mk. e.; little activity. Salicylic, in fair request with short supplies at 165 mk. d.; 190 mk. e. Sulphuric, freely offered at 4.60 mk. d.; some business passing for export. Tartaric crystallised, 180 mk. d.; 200 mk. e.

INDUSTRIAL CHEMICALS: Alum: Potash crystal powder, 8.50/9 mk. d.; 11 mk. e.; chrome, 15%, meeting with decreased demand at 34 mk. d. and 39/40 mk. e. Alumina sulphate, unchanged with poor demand. Barium chloride crystals, in strong demand and short offerings at 23 mk. d. Bleaching powder, 80%, 14 mk. e. Borax, crystallised, 44.50 mk. d. Calcium chloride has weakened lately; 70/75 %, 7 mk. d.; 90/95%, 10 mk. d. Copperas attracts little attention at 4.50/5, 50 mk. d.; 6.50 mk. e. Copper sulphate, 98/100%, was in fair request; export somewhat neglected; quotation: 38 mk. d.; 40 mk. e. Epsom salt neglected. Glauber's salt, tech., crystallised, freely offered at 3 mk. d.; 4 mk. e. Glycerine, double distilled, chemically pure, 28°, 95 mk. d.; 100 mk. e. Lead, red, 44 mk. d.; 46 mk. e. Lead, white, 40 mk. d.; 42 mk. e.; all leads meeting with brisk demand. Sugar of lead, 44 mk. d.; 48 mk. e. Litharge, 43 mk. d. Lithopone, in brisk demand; red seal, 30%, 19 mk. d.; 26 mk. e.; green seal, 23 mk. d. Magnesium chloride, fused, in barrels, freely offered at 6 mk. e., meeting with hardly any demand. Nickel sulphate, 56 mk. d. Potash bichromate, offerings exceed demand; quoted at 62/63 mk. d.; 83 mk. e. Potash, carbonate, 96/98%, some business passing at 32 mk. d.; 41 mk. e. Potash, caustic, 27/28 mk. d. Potash, chlorate, 32 mk. d.; 37 mk. e. Potash metabisulphite, considerable orders placed at 50 mk. d.; 60 mk. e. Potash permanganate met with more interest from inland and abroad at 67/75 mk. d.; 82 mk. e. Potash, prussiate, yellow, 180 mk. d. Potash, saltpetre, 28/35 mk. d. Salol, 180 mk. d.; 220 mk. e. Salt cake, offerings in excess of demand; loose is quoted at 5 mk. d.; 5.50 mk. e. Soda Ash, offered freely, with little demand, at 13.50/13.75 mk. d. Soda, Caustic, 120/128°, 29.50 mk. d. Soda Crystals, reduced demand, and increased offerings at 8 mk. d. Soda Hyposulphite, 12 mk. d.; 15 mk. e. Soda Saltpetre, tech., 21.50 mk. d. Soda Sulphide, demand only for export; offerings rather plentiful; 30/32%, 11 mk. d.; crystallised, sulphite free, 32 mk. d.; 60/62%, 21 mk. d.; 23 mk. e. Sulphur, fine ground, 14 mk. d. Zinc White, red seal, 40/50 mk. d.; 53 mk. e.; green seal, 57 mk. d.; 58 mk. e.

The Nitrate Market

IN their latest report on the nitrate of soda market, Aikman (London), Ltd., state that there has been no outstanding feature during the past six months, although trade in all directions shows distinct signs of improvement. The levelling down of prices which has been in progress since the slump appears to have spent itself, and a more confident feeling consequently prevails on all sides. An unusually protracted winter and late spring delayed the application of nitrogenous fertilisers, but, nevertheless, the season closes with stocks in consuming markets reduced to a minimum. The world's consumption for the year ending June 30 amounts to 1,544,000 tons, against 1,429,000 tons the previous year and 1,882,000 tons for the year ended June 30, 1920. Of the total supply in sight at date—viz., 1,851,500 tons, it is estimated that 1,200,000 tons are in the hands of producers, and 651,500 tons already disposed of to dealers for next season's delivery.

Manchester Chemical Market

Monthly Report by Sir S. W. Royse & Co., Ltd.

SINCE the Whitsuntide holidays, business has moved along steadily and there is a better inquiry, especially for export. Values have been irregular, some articles having a distinctly firmer tendency, whilst producers of others have found it possible to make some concessions. The termination of the long-drawn-out dispute in the engineering trade is a satisfactory feature.

Sulphate of copper is somewhat firmer and dearer and exports are of fairly satisfactory volume. Green copperas has been offering at low prices, but the demand shows no improvement. Acetates of lime are rather easier both in price and quantities available. Although acetic acid has been offering from American makers at reduced figures the market has remained steady and has recently had a firmer tendency. Importations of acetate of soda are arriving more freely and are selling at below British makers' prices; the inquiry for prompt supplies is good.

Lead products have sold slowly. British red lead and litharge are advanced but the demand is unsatisfactory; Continental offerings are on a reduced level. Lead acetate is steady with prices a little easier, and the foreign article is pressed for sale at low rates. Nitrate of lead is unchanged in price; German make is quoted at competitive figures for shipment. The demand for carbonate and caustic potash has been only fair and prices are slightly lower. Montreal potashes remain quiet. In yellow prussiates, potash has strongly advanced and is now extremely scarce; soda also is only in very limited supply and is again dearer. White powdered arsenic has continued scarce and higher figures are being realised. Tartaric and citric acids have been keenly sought and, available quantities being already well booked, prices show a good increase. Cream of tartar also is selling freely, but the position in this article is not so acute.

Bichromates of potash and soda are still without any quotable variation and are quiet. Chlorates of potash and soda also are unchanged. Borax and boracic acid remain quietly steady. Phosphate of soda has a slightly easier tendency, some fair quantities having been imported. Alum and sulphate of alumina are without improvement in demand. Muriate of ammonia is selling well for export. Manufacturers of bleaching powder and caustic soda have made good concessions in prices for delivery during this year.

There is little new to report in the position of tar products. Benzols and toluols if anything are slightly easier with only a moderate demand. Solvent naphtha remains quiet and business passing is keenly competed for, with resultant reduced values. Creosote oil is somewhat firmer owing no doubt to the demand that has taken place for dehydrated tar for the roads. All grades of carbolic remain unchanged. Naphthalenes are without inquiry. There has been a fair demand for dehydrated tar for the roads in the Midlands and South, but in the North the demand has not been what was anticipated and prices are easier. The sudden demand for pitch caused by the spurt in the briquette trade last month having now been satisfied, present values are more or less nominal. Neither suppliers nor consumers are inclined to cover the forward position. Sulphate of ammonia is unchanged.

Farina and dextrine continue in short supply for near delivery. Barytes is quoted at a slight reduction, and continental producers are offering freely at low figures. Paraffin wax and scale have been advanced in price but there is little demand. The prices of China clay have been reduced by 3s. per ton for deliveries during this year. The value of American turpentine is strongly enhanced on reports of a possible shortage and the Swedish article is obtainable at less than half of the current figure for the American.

Company News

DISTILLERS CO., LTD.—The ordinary and preference share registers are closed until July 14.

BROUGHTON COPPER CO., LTD.—A final dividend of 10 per cent. actual, less tax, is announced on the ordinary shares, making 12½ per cent. for the year.

VICKERS, LTD.—The directors declare, subject to sanction in general meeting, a dividend for 1921 at the rate of 5 per cent. per annum, less tax at 6s. in the £, on the ordinary shares of the company. This dividend is payable on July 28.

CIE. NATIONALE DE MATIERES COLORANTES ET DE PRODUITS CHIMIQUES.—The net profit for the past year was 3.8 million fr., against 12.5 million fr. in the preceding year. It is proposed to pay a dividend of 5 per cent., as compared with 15 per cent.

UNITED GLASS BOTTLE MANUFACTURERS, LTD.—The report for 1921 shows a loss of £139,713. The amount brought in was £35,329, £85,000 has been transferred from reserve, and £80,000 for contingencies account. The issue expenses have been written down by £15,066, while a credit balance of £29,077 is carried forward.

SAN PATRICIO NITRATE CO., LTD.—The net profit for the year to December 31 last was £2,569 and £9,362 was brought in, making £11,931. Dividend at 2½ per cent. absorbs £2,500, leaving £9,431 to be carried forward. The report states that, in view of the large stocks in Chile, the oficina will not be re-opened, but its quota will be sold.

NEW TRANSVAAL CHEMICAL CO.—The directors announce interim dividends for the half-year to December 31 last of 3 per cent., less tax, on the cumulative first preference shares, and of 4 per cent., less tax, on the cumulative "A" preference shares. Holders of share warrants to bearer should present Coupon No. 26 at the offices of Messrs. Erlanger, 8, Crosby Square, London, for payment of dividend.

BURMAH OIL CO., LTD.—The profit for the year, after charging depreciation, etc., was £1,247,687, and allowing for income tax and all other charges, was £1,902,790. The directors recommend, subject to final audit, a final dividend of 4s. per share on the ordinary shares, payable on July 20 to holders on the registers at June 27. A balance of £359,583 will be carried forward, subject to Corporation profits tax.

UNITED PREMIER OIL AND CAKE CO., LTD.—The directors have decided to pay a further interim dividend of 2½ per cent., less tax, on the ordinary shares in respect of the year ending December 31 last, making 5 per cent., less tax, for the year. The dividend is payable to-day (Saturday) to holders on the registers at June 30. The annual meeting will be convened as soon as the audit of the accounts has been completed.

RECKITT AND SONS.—The directors announce an interim dividend of 8d. per share, less tax, on the ordinary shares. The directors also announce that interim dividends payable on June 30, September 30, and December 31 will be at rate of 8d., instead of 6d. per share as heretofore. They state that this does not imply that the total dividends for the year will exceed those for 1921, when a total of 3s. per share was paid. As three interim dividends of 6d. each will be paid, it must not be assumed that the final dividend will exceed 1s.

BOOTS PURE DRUG CO., LTD.—The consolidated statement as at March 31 last states that the profit earned during the year by associated companies, after providing for management expenses, income and corporation profits tax and depreciation on fixtures, plant, etc., but before providing for directors' fees, amounted to £580,579. Dividends have been paid on the preference and preferred ordinary shares amounting to £217,235, leaving £363,344; deduct dividends paid to ordinary shareholders, £244,799; surplus profit on year's trading £118,545. This sum added to surplus and undivided profits brings this item, exclusive of goodwill, up to £1,331,688.

BRITON FERRY CHEMICAL AND MANURE CO.—In a circular addressed to the shareholders, the directors state that since beginning of the year the improved demand for acid referred to in their last report has continued, but the company was prevented from deriving full benefit therefrom owing to strike of acid workers in South Wales in March and April, which lasted seven weeks. The fall in the price of superphosphate, with the impossibility, owing to the strike, of working off stocks of raw material, affected this branch of the business. In these circumstances the directors consider it prudent to adopt a conservative policy, and have decided to defer the payment of dividends on the preference and ordinary shares until the effect of the abnormal and unfavourable conditions has passed away.

Chemical Trade Inquiries

The following inquiries, abstracted from the "Board of Trade Journal," have been received at the Department of Overseas Trade (Development and Intelligence), 35, Old Queen Street, London, S.W.1. British firms may obtain the names and addresses of the inquirers by applying to the Department (quoting the reference number and country), except where otherwise stated.

LOCALITY OF FIRM OR AGENT.	MATERIAL.	REF. No.
Netherlands ..	Carbolic and nitric acid, naphthalene, lithopone, paint	16011/F.W./G.C./A.
Adelaide ..	Chemical and pharmaceutical goods, etc.	412/20/7/9080
Cuba	Liquid coal-tar disinfectant ..	D.O.T. 6257/F.L./S.C.2.

Tariff Changes

GIBRALTAR.—The tax on fuel oil exported from Gibraltar has been abolished.

AUSTRALIA.—A notice relating to extended concessions as to drawback allowance, and the basis of valuation for Customs duty, appeared in the Board of Trade *Journal* of June 29 (p. 737).

NEW ZEALAND.—A revised Customs interpretation of oils has been issued. The text of the Order was published in the Board of Trade *Journal* of June 29 (p. 737).

EGYPT.—As from August 1 next consignments of chemical manures will not be admitted into Egypt unless accompanied by an official certificate of analysis.

SWITZERLAND.—The importation of demijohns cased in wicker may be effected without special authorisation over the Italo-Swiss frontier.

BELGIUM.—As from June 24 an import duty of 10 p. per hectolitre is imposed on light oils or spirits, of a density of less than 0·77 at 15° C., arising from the refining or distillation of petroleum, schist, lignite and other similar mineral oils. All mineral oils were formerly duty free.

UNITED STATES OF AMERICA.—Amendments (up to May 23) made by the Senate in the Bill for the revision of the Customs tariff were notified in the Board of Trade *Journal* of June 29 (p. 739). Chemicals, dyes, &c., are the products chiefly affected.

SIERRA LEONE.—The importation of methylated spirits which have not been mineralised is now prohibited except by special permission of the Governor. "Mineralised methylated spirits" are defined in the present Order to mean methylated spirits containing 10 per cent. by volume of wood naphtha, and which, in addition, have mixed with them not less than ·385 per cent. of mineral naphtha of a specific gravity of not less than ·800.

Annual Meeting of The British Association

As previously announced, the annual meeting of the British Association for the Advancement of Science will meet at Hull from September 6 to 13. Professor Sir C. S. S. Sherrington will succeed Sir Edward Thorpe as President of the Association, and his presidential address will be on "Some Aspects of Animal Mechanism." In the course of the meeting there will be two evening discourses, in the second of which Dr. F. W. Aston will lecture on "The Atoms of Matter; their Size, Number and Construction." The President of the Chemistry Section, Principal J. C. Irvine, will lecture on "Research Problems in the Sugar Group."

A special effort is being made this year to attract the younger generation of students. Thanks to the gift of £10,000 of War Stock recently handed over to the Association by Sir Charles A. Parsons, the Association has offered a certain number of exhibitions to universities and university colleges in Great Britain.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible or any errors that may occur.

County Court Judgments

[*NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.*]

BURGIN, C. E. (wife of Charles Burgin), 35, Gray's Inn Road, manufacturing chemist. £16 12s. 10d. May 2.

IMPERATOR DISINFECTANTS, LTD., registered office, East Canal Wharf, Cardiff, merchants. £10 19s. 6d. May 4.

JAMES, E. W., 56 and 58, Oxford Street, Mountain Ash, and 33, Rheola Street, Penrhiwceiber, chemist. £42 1s. 10d. May 9.

PINDER, Mr. H., 22, Prince Street, Bridlington, chemist. £11 15s. May 8.

QUESTEDS M. DRUG STORES, 32, Plumstead Road, S.E., chemists. £19 19s. 5d. May 4.

QUESTED, Marie (widow), 32, Plumstead Road, S.E., druggist. £18 5s. May 1.

Receiverships

BIGSBYS MITCHAM, LTD. W. C. Mininack, of 16, Hill Street, Jersey, ceased to act as receiver or manager on November 23, 1921.

SAPON SOAPS, LTD. On June 21, 1922, J. L. Harvey, of 47, King William Street, and S. C. Hawkins, of 5, Threadneedle Street, E.C., appointed E. Dexter, of 21, Ironmonger Lane, E.C., as receiver and manager of the property of Sapon Soaps, Ltd., under powers contained in debentures dated April 6 and September 28, 1921.

Bills of Sale

EDRIDGE, Frederick James, 82, Pedro Street, Homerton, glass bottle manufacturer. July 3. £80.

LEWIS, Jack Morton, 1, Holmdale Mansions, Holmdale Road, Hampstead, chemist. July 3. £85.

WAKEFIELD, John Henry, then of St. Elmo, Earlswood Road, Dorridge, Knowle, chemist. Registered July 13, 1912; re-registered June 30, 1922. £35.

Mortgages and Charges

[*NOTE.—The Companies Consolidation Act, of 1908, provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.*]

BOYD AND DOWER, LTD., Liverpool, chemists.—Registered June 26, £550 debentures; general charge. *Nil. December 21, 1921.

CALDER CARBONISING CO., LTD., Sowerby Bridge.—Registered June 22, £792 mortgage charged on freehold warehouse in Victoria Street, Sowerby Bridge.

RADIUM ORE MINES, LTD., London, W.C.—Registered June 9, £1,052 and £190 debentures part of £10,000; general charge. *£3,492. December 31, 1920.

NEWCASTLE AND SUNDERLAND OXY-ELECTRIC WELDING AND METALLURGICAL CO., LTD.—Registered June 7, £300 debenture; general charge. *Nil. February 8, 1922.

TRIAD CO., LTD., London, S.W., paint manufacturers, etc.—Registered June 7, £5,000 debentures, present issue, £1,000; general charge. *Nil. February 24, 1922.

TRIPLEX SAFETY GLASS CO., LTD., London, W.C.—Registered May 5, £75,000 debentures plus a bonus of 5 per cent., present issue £50,000; general charge; also registered May 5, charge, dated April 25, 1922 (collateral to debentures of even date) securing £30,000 to Cox and Co; charged on company's leasehold property and machinery.

WEST RIDING CHEMICAL CO., LTD., Thornes.—Registered June 21, £50,000 debentures, present issue £26,000; general charge. *£20,000. April 6, 1921.

London Gazette

Company Winding up Voluntarily

BIRMINGHAM STARCH AND MANUFACTURING CO., LTD.—J. E. Pritchard, 115, Colmore Row, Birmingham, appointed liquidator. Meeting of creditors at the Chamber of Commerce, New Street, Birmingham, Thursday, July 6, at 3 p.m.

New Companies Registered

DIAMOND SODA CO., LTD., 11-12, Fenchurch Street, London. Manufacturing, analytical, and consulting chemists, manufacturers of essential or other oils, importers and exporters of and dealers in chemicals, drugs, soda, oils, fertilisers, etc. Nominal capital, £100 in £1 shares.

CHAMBERS AND HAMMOND, LTD., chemical engineers, etc. Nominal capital, £15,000 in £1 shares. A director: E. V. Chambers, The Manse, Lightcliffe.

HODGE AND GOODMAN, LTD., 17A, Ellen Street, Spring Hill, Birmingham. Lacquer, varnish, paint and enamel manufacturers, etc. Nominal capital, £1,000 in £1 shares.

BONO CO., LTD., 12, Clarges Street, Mayfair, London. Insecticide manufacturers, etc. Nominal capital, £5,000 in £1 shares.

A. SANTOS SILVA CO., LTD., 333-337, Corn Exchange Buildings, Manchester. Agents for and dealers in chemicals, oils, fertilisers, etc. Nominal capital, £5,000 in £1 shares (4,000 ordinary and 1,000 deferred ordinary).

Benzol and By-Products

ADDRESSING the shareholders of the Benzol and By-Products Co., Ltd., at the annual general meeting held in London on June 28, Sir Henry Bax-Ironside said that had the company not been the possessors of very efficient and capably conducted coke-ovens and by-product works, its colliery would long since have had to follow the fate of others by being shut down. As it was, he was pleased to say that their by-product works had continued to earn large profits. He could not but think that when an important product reached the stage of being produced at a heavy loss there must ultimately be a reaction. He believed that this reaction could not be long delayed, but in the interim the policy they had adopted was one which should commend itself to all, namely conservation of their resources for the time being, and, in consequence, in the absence of accounts of a definite nature, and inability favourably to forecast colliery losses and their overall effect, it was not deemed prudent to pay further dividends for the present. In arriving at this conclusion they were following in the wake of some of the largest and oldest-established companies in the kingdom. The directors had for many months past borne in mind the fact that could the colliery loss be reduced to a certain extent, the by-product profit would probably be more than would be required to pay preference dividends. With that end in view, negotiations of considerable importance had been, and were, taking place, and it was hoped that in the early autumn these would fructify.